1997

Revised

EV1™

Body/Repair

Service Manual

*

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CAUTION

To reduce the chance of personal injury and/or property damage, the following instructions must be carefully observed.

Proper service and repair are important to the safety of the service technician and the safe, reliable operation of all motor vehicles. If part replacement is necessary, the part must be replaced with one of the same part number or with an equivalent part. Do not use a replacement part of lesser quality.

The service procedures recommended and described in this service manual are effective methods of performing service and repair. Some of these procedures require the use of tools specifically designed for the purpose.

Accordingly, anyone who intends to use a replacement part, service procedure, or tool that is not recommended by the vehicle manufacturer must first determine that neither his safety nor the safe operation of the vehicle will be jeopardized by the replacement part, service procedure, or tool selected.

It is important to note that this manual contains various “Cautions” and “Notices” that must be carefully observed in order to reduce the risk of personal injury during service or repair or the possibility that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that these “Cautions” and “Notices” are not exhaustive; it is impossible to warn of all the possible hazardous consequences that might result from failure to follow these instructions.

This vehicle has a high voltage power system. Disabling the system is required when working on or around the high voltage system and high voltage batteiy pack (other than testing the system using the procedures in this manual).

To help avoid severe shocks and burns and vehicle damage, always follow the cautions in this manual to disable the high voltage system. See the high voltage disable and enable procedure in the front of this service manual.

This vehicle is equipped with Supplemental Inflatable Restraint (SIR). Refer to “CAUTIONS” under “On-Vehicle Service” and the SIR Component and Wiring Location views in the “SIR Service Manual” before performing service on or around SIR components or wiring. Failure to follow “CAUTIONS” could result in possible air bag deployment, personal injury, otherwise unneeded SIR system repairs.

To help avoid accidental air bag deployment and personal injuiy, when servicing a vehicle that requires repair of the SIR system and another vehicle system, it is recommended that the SIR be repaired first using service manual procedures.

CAUTION

Saturn Service Manuals are intended for use by professional, qualified technicians. Attempting repairs or service without the appropriate training, tools, and equipment could cause injuiy to you or others and damage to your vehicle that may cause it not to operate.

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BODY/REPAIR

NOTICE

Always use the correct fastener in the proper location. When you replace a fastener, use ONLY the exact part number for that application.

Saturn Corporation will call out those fasteners that require a replacement after removal. Saturn Corporation will also call out the fasteners that require thread lockers or thread sealant.

UNLESS OTHERWISE SPECIFIED, do not use supplemental coatings (paints, greases, or other corrosion inhibitors) on threaded fasteners or fastener joint interfaces. Generally, such coatings adversely affect the fastener torque and the joint clamping force, and may damage the fastener.

Wlien you install fasteners, use the correct tightening sequence and specifications.

Following these instructions can help you avoid damage to parts and systems.

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GLOSSARY OF ACRONYMS

Acronym	Definition
ABS	Anti-Lock Braking System
AC	Alternating Current
AM	Amplitude Modulation
Amp	Ampere
APM	Accessory AC and DC Power Control Module. With PIM, makes up PEB
APS	Auxiliary Power Supply (part of APM)
BCA	Bias Control Assembly
BPM	Battery Pack Module
BRS	Battery Reserve Switch
BTCM	Brake/Torque Control Module
BTSI	Brake Transmission Shift Interlock (GM)
CD	Compact Disc
cfm	Cubic Feet per Minute
eg	Center of Gravity
CHMSL	Center High-Mount Stop Lamp
CMC	Compressor Motor Controller (part of APM)
CPA	Connector — Positive Assurance
CR	Charge Receptacle
CRFM	Condenser Radiator Fan Module (part of HPVS)
CTPS	Check Tire Pressure System
DC	Direct Current
DLC	Data Link Connector
DERM	Diagnostic and Energy Reserve Module (SIR control module)
DIA	Dealer Installed Accessory
DM	Drive Motor
DRL	Daytime Running Light
E/M	English/Metric
EHPS	Electro-Hydraulic Power Steering
EKP	External Keypad
EMB	Electro-Magnetic Brake (part of ABS)
EMI	Electromagnetic Interference
EPS	Electric Power Steering. Also see EHPS

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GLOSSARY OF ACRONYMS CONTINUED

Acronym	Definition
EEPROM	Electronically Erasable Programmable Read Only Memory
ETS	Electronic Traction System
EV	Electric Vehicle
EVO	Electronic Variable Orifice
FLIP	Forward Lamp - Instrument Panel Harness. Name of major EV low voltage wire harness
FM	Frequency Modulation
FOD	Front of Dash
g	Gram
GFI	Ground Fault Interrupt
GVMR	Gross Vehicle Mass Rating
GVW	Gross Vehicle Weight
HPVM	Heat Pump Ventilation Module
HPVS	Heat Pump Ventilation System. Similar to HVAC on ICE vehicles
HTCM	HPVS/Thermal Control Module
HV	High Voltage
HVAC	Heating, Ventilating, and Air Conditioning (on ICE vehicles. For EV, see HPVS).
HWS	Heated Windshield
HWS	Hand Wheel Sensor
Hz	Hertz (cycles per second)
IC	Integrated Circuits
ICE	Internal Combustion Engine
IGBT	Isolate Gate Bipolar Transistor
I/O	Input(s)/Output(s)
IP	Instrument Panel
ISRV	Inside Rear View (mirror)
JB	Junction Block
KAM	Keep Alive Memory
kg	Kilogram
km	Kilometer
km/h	Kilometers per hour

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GLOSSARY OF ACRONYMS CONTINUED

Acronym	Definition
kPa	Kilo Pascals
kW	Kilowatt
kWh	Kilowatt-hour
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LF	Left Front
LH	Left Hand
LHD	Left Hand Drive
LHJB	Left Hand Junction Block
LR	Left Rear
LVW	Loaded Vehicle Weight
m	Meter
MMC	Metal Matrix Composite (rear brake drum material)
MHz	Megahertz
mi	Mile(s)
MPH	Miles Per Hour
MSRP	Manufacturers Suggested Retail Price (includes dealer preparation)
MUX	Multiplex or Multiplexer
N	Newton(s)
NTF	No Trouble Found. Reported failure does not reoccur under test
OEM	Original Equipment Manufacturer
OSRV	Outside Rear View (mirror)
PCM	Propulsion Control Module (Drive Motor)
PDT	Portable Diagnostic Tool
PEB	Power Electronics Bay
PIM	Power Inverter Module
POA	Part of Assembly
PPS	Pedal Position Sensor
PRND	Park-Reverse-Neutral-Drive, as in PRND Selector
PROM	Programmable Read Only Memory
PSOC	Pack State of Charge
PTC	Positive Thermal Coefficient. Term for resistive heating module

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GLOSSARY OF ACRONYMS CONTINUED

Acronym	Definition
PWM	Pulse Width Modulation, or Pulse Width Modulated
QDM	Quad Driver Module
RAM	Random Access Memory
RAP	Retained Accessory Power
RF	Right Front
RF	Radio Frequency
RH	Right Hand
RHJB	Right Hand Junction Block
RMS	Root-Mean-Squared
ROM	Read Only Memory
RP	Reduced Performance
RPM	Revolutions Per Minute
RR	Right Rear
RSA	Run/Lock Shifter Assembly
SAE	Society of Automotive Engineers
SDL	Serial Data Link
SDM	Sensor Diagnostic Module
SIR	Supplemental Inflatable Restraint (air bag) system
SLA	Short-Long Control Arm (suspension system)
SOC	State of Charge (battery pack). Usually expressed as a percentage
SN	Service Now
SSPO	Saturn Service Parts Operation
SS	Service Soon
SWA	Steering Wheel Angle
TNF	Trouble — Not Found. Reported failure reoccurs but cause cannot be determined
TJB	Trunk Junction Block
TOD	Time of Day
TPA	Terminal — Positive Assurance
T/S	Turn Signal
TT	Telltale

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GLOSSARY OF ACRONYMS CONTINUED

Acronym	Definition
UART	Universal Asynchronous Receiver — Transmitter (communications IC)
UH	Under Hood
ULEV	Ultra-Low Emissions Vehicle
USOC	User State Of Charge
V5B	5 Volt Supply
VAC	Voltage, Alternating Current
VF	Vacuum Fluorescence
VH	Vehicle Handling
VIN	Vehicle Identification Number
VTD	Vehicle Theft Deterrent
W	Watt
WSS	Wheel Speed Sensor (part of ABS)
WSW	Windshield Washer/Wiper
ZEV	Zero Emission Vehicle

B

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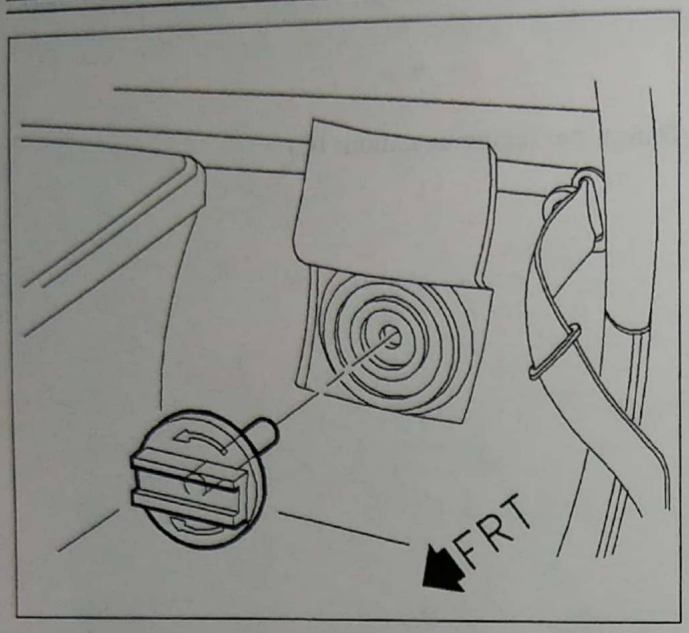


PSMPEN65995AA

HIGH VOLTAGE DISABLE

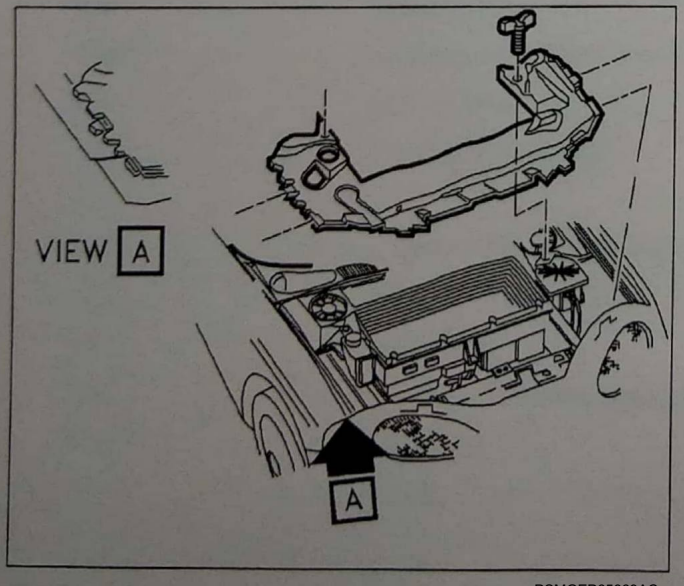
REMOVAL

CAUTION: TO REDUCE THE RISK OF SEVERE SHOCKS AND BURNS, THE HIGH VOLTAGE SYSTEM SHOULD BE DISABLED ANY TIME SERVICE WORK IS BEING PERFORMED ON OR AROUND THE HIGH VOLTAGE SYSTEM. WHEN IN DOUBT, ALWAYS DISABLE THE HIGH VOLTAGE SYSTEM. THE 12 VOLT SYSTEM WILL STILL BE ACTIVE AFTER THE HIGH VOLTAGE SYSTEM HAS BEEN DISABLED.

1. Place the vehicle in the “RUN” mode.
2. Remove the manual disconnect knob.
   a. Tilt the drivers seat forward.
   b. Raise the carpet flap, located on the battery tunnel behind the drivers seat.
   c. Turn the manual disconnect knob counterclockwise and pull the manual disconnect knob straight out.

IMPORTANT: An audible click should be heard when turning the manual disconnect knob. This click indicates the automatic disconnect relays have opened.

3. Verify high voltage has been removed.
   a. Connect scan tool to the data link connector (DLC) and run the High Voltage special test. Battery pack module (BPM) diagnostic trouble codes (DTCs) 312, 280 and/or 275 should be present, which indicates BPM and auto disconnect recognized a high voltage disconnect.
   b. If test fails, refer to service manual “High Voltage Special Test Failed" in the “Battery and Charging System Service Manual.”
4. Remove engine compartment sight shield.



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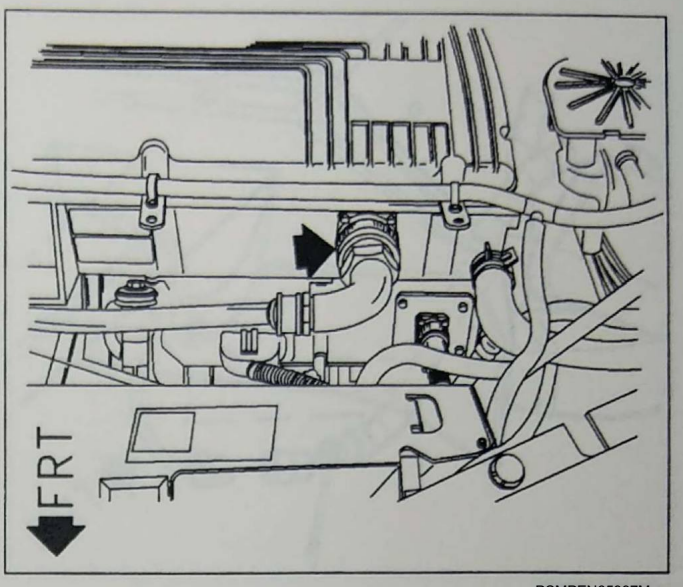
CAUTION: TO REDUCE THE RISK OF SEVERE SHOCKS AND BURNS, ALWAYS ASSUME 1 HE HIGH VOLTAGE IS PRESENT WHEN DISCONNECTING THE CHARGE RECEPTACLE TO PIM CONNECTOR. DO NOT ALLOW THE CONNECTOR BODY TO TOUCH THE PINS OF THE PIM WHEN REMOVING THE CONNECTOR.

5. Remove the charge receptacle to power inverter module (PIM) cannon connector using one hand.



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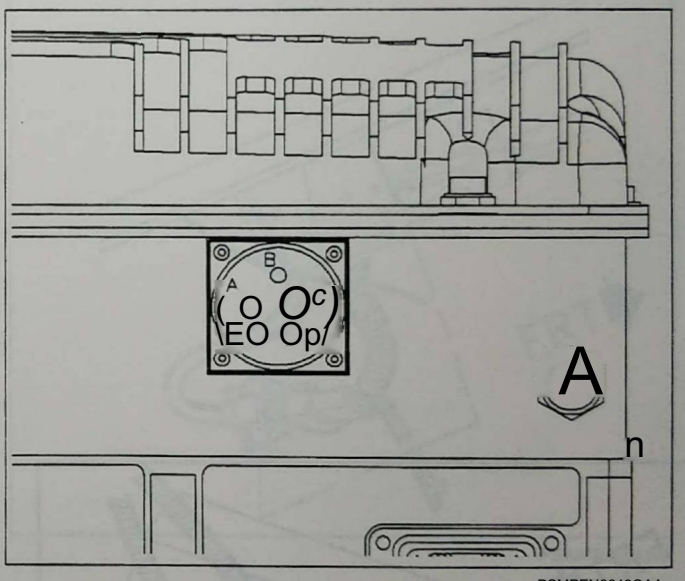
6. Using a DVOM and only one hand, measure from pin A of the PIM to chassis ground and from pin C of the PIM to chassis ground and from pin A to C. .All measurements should be less than 10 volts. Pin C and Pin A are the large high voltage pins on the PIM.

   a. If the voltage is less than 10 volts, high voltage system is disabled.

   b. If the voltage is greater than 10 volts, refer to the "High Voltage" section in the "Battery and Charging Service Manual."



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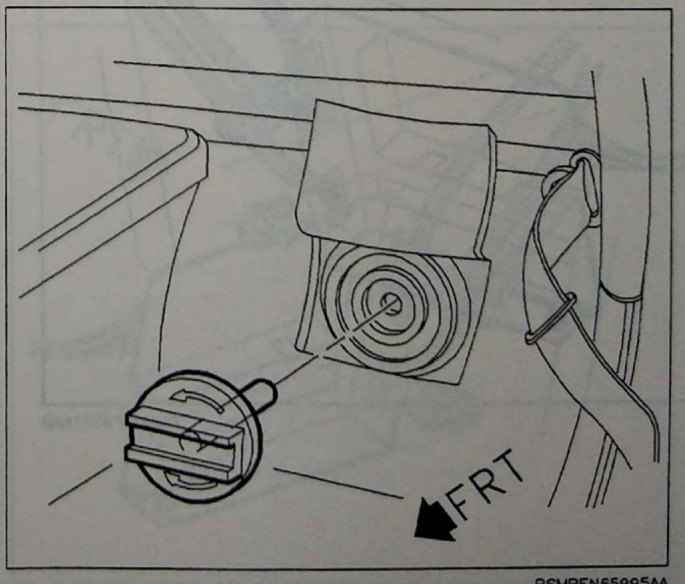
HIGH VOLTAGE ENABLE

INSTALLATION

1. Install charge receptacle to PIM cannon connector.
2. Install engine compartment sight shield.
3. Tilt driver's seat forward.
4. Raise the carpet flap, located on the battery tunnel behind the driver's seat.
5. Install the manual disconnect knob by pushing the shaft straight into the hole and turning clockwise.
6. Clear all DTCs using the scan tool.



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SIR SYSTEM

ON VEHICLE SERVICE

SERVICE PRECAUTIONS

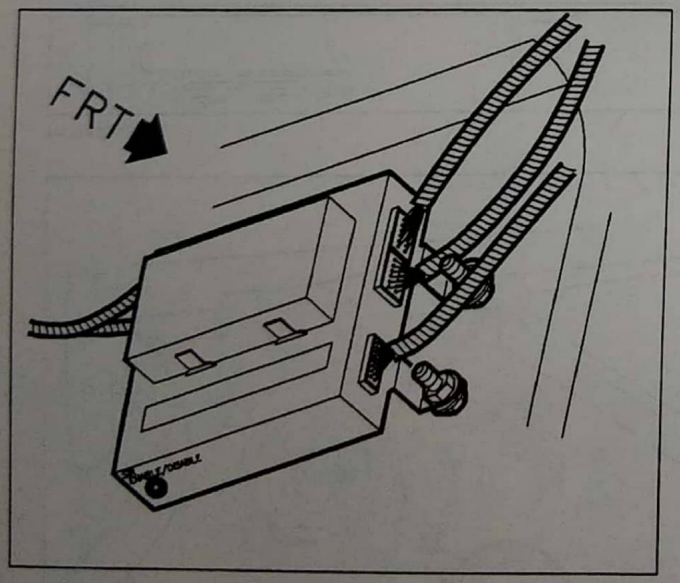
CAUTION: WHEN PERFORMING SERVICE ON n AROUND SIR COMPONENTS OR SIR WIRING FOLLOW THE PROCEDURE BELOW TO TEMPORARILY DISABLE THE SIR SYSTEM. FAILURE TO FOLLOW PROCEDURES COULD RESULT IN POSSIBLE AIR BAG DEPLOYMENT PERSONAL INJURY OR OTHERWISE UNNEEDED SIR SYSTEM REPAIRS.

THE SENSING AND DIAGNOSTIC MODULE (SDM) CAN MAINTAIN SUFFICIENT VOLTAGE TO CAUSE A DEPLOYMENT FOR UP TO *10 MINUTES* AFTER THE KEY PAD HAS BEEN PLACED IN THE "LOCK" MODE, ALSO IF THE AUXILIARY BATTERY IS DISCONNECTED OR THE SIR "ENABLE/DISABLE" SWITCH IS PLACED IN THE DISABLE POSITION. MANY OF THE SERVICE PROCEDURES REQUIRE THE SIR "ENABLE/DISABLE" SWITCH TO BE PLACED IN THE "DISABLE" POSITION AND DISCONNECTION OF THE DEPLOYMENT LOOPS TO AVOID AN ACCIDENTAL DEPLOYMENT.

DISABLING THE SIR SYSTEM

1. Turn the steering wheel so that the vehicle's wheels are pointing straight ahead.
2. Place the key pad in the LOCK mode.
3. Place the SIR "ENABLE/DISABLE" switch in the right hand junction block in the DISABLE position.

IMPORTANT: With the SIR ENABLE/DISABLE switch in the DISABLE position and the key pad in the RUN mode, the AIR BAG telltale lamp will be "On." This is normal operation and does not indicate an SIR system malfunction.



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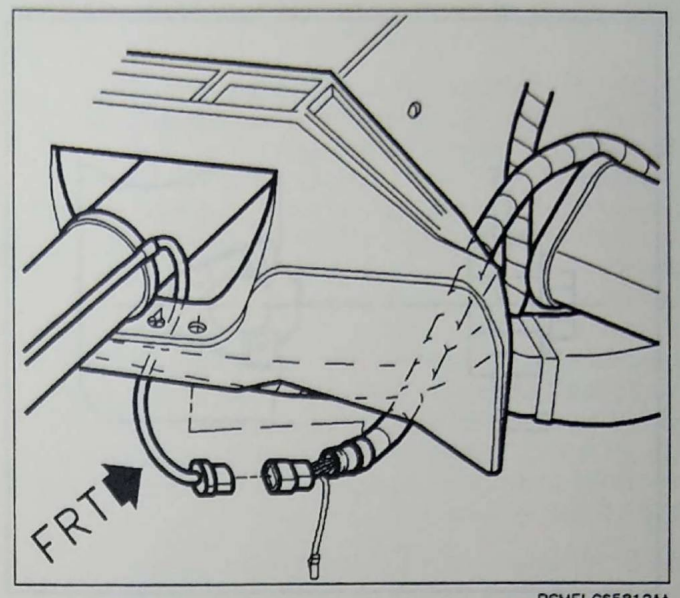
4. Remove connector position assurance (CPA) device and disconnect yellow two-way connector located near the base of the steering column.



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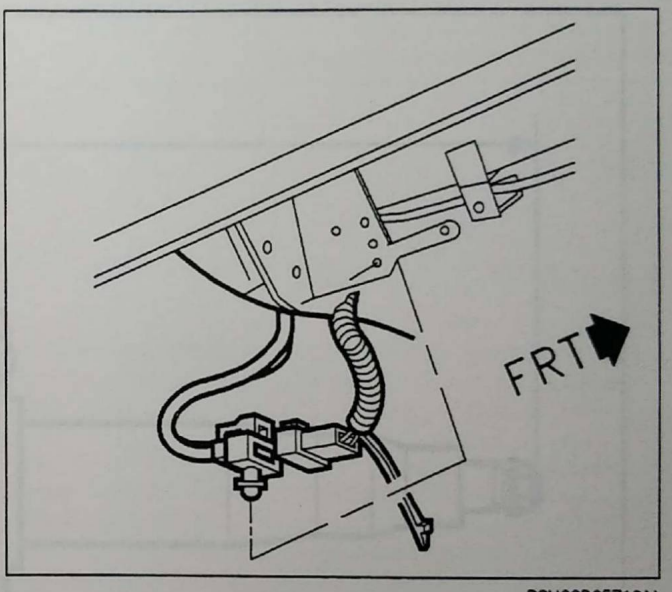
5. Remove connector position assurance (CPA) device and disconnect yellow' two-way connector located on passenger inflator module pigtail under RH side of IT



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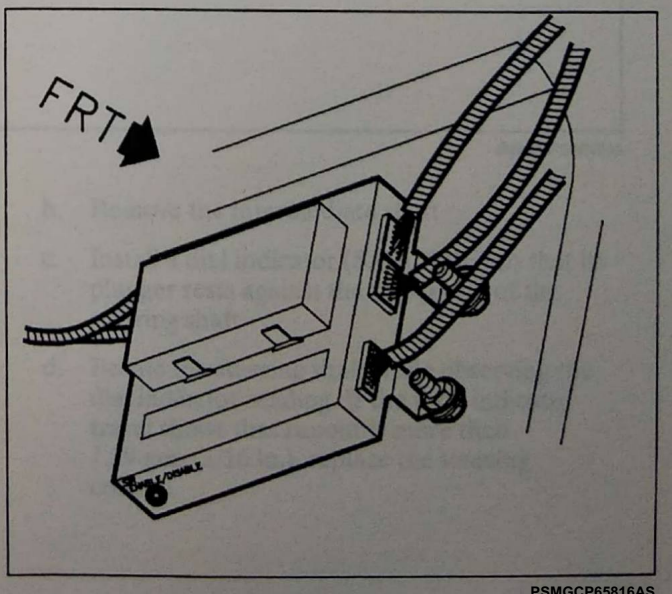
ENABLING THE SIR SYSTEM

1. Place key pad in the LOCK mode.
2. Connect yellow two-way SIR connector at the base of steering column and install connector position assurance (CPA) device to connector.
3. Connect yellow two-way passenger inflator module pigtail and install connector position assurance (CPA) to connector.
4. Place SIR ENABLE/DISABLE switch to the ENABLE position, located in the RH junction block.
5. Place key pad in the "RUN" mode and verify that the AIR BAG telltale lamp flashes seven times as the key pad is placed in the "RUN" mode and then goes Off. If lamp does not operate as described above perform the "SIR Diagnostic System Check" in this manual.



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REPAIRS AND INSPECTIONS REQUIRED AFTER AN ACCIDENT

IMPORTANT: The following SIR system components **must** be replaced after a frontal crash involving air bag deployment:

- SDM
- Driver inflator module
- Passenger inflator module
- Driver seatbelt retractor
- Passenger seatbelt retractor

In all types of accidents regardless of air bag deployment, visually inspect the following components and their mounting points and replace as required:

- Driver inflator module
- Steering wheel
- SIR coil assembly
- Steering column
- Steering column support foam energy absorber
- Driver seat and belts
- Passenger inflator module
- Passenger seat and belts
- SDM
- Knee bolsters and instrument panel mounting attachments

Inspect the SIR coil assembly wiring and steering wheel for any signs of scorching, melting, or damage due to excessive heat. If the coil assembly wire or steering wheel is damaged, replace them. The steering column and wheel must be dimensionally checked to determine if they are damaged.

Never use SIR parts from another vehicle.

Do not attempt to repair the driver or passenger inflator modules, the steering wheel, the SIR coil assembly, the steering column, or the SDM. Service of these items is by replacement only. Verify replacement part numbers. No periodic maintenance of SIR components or system is required.

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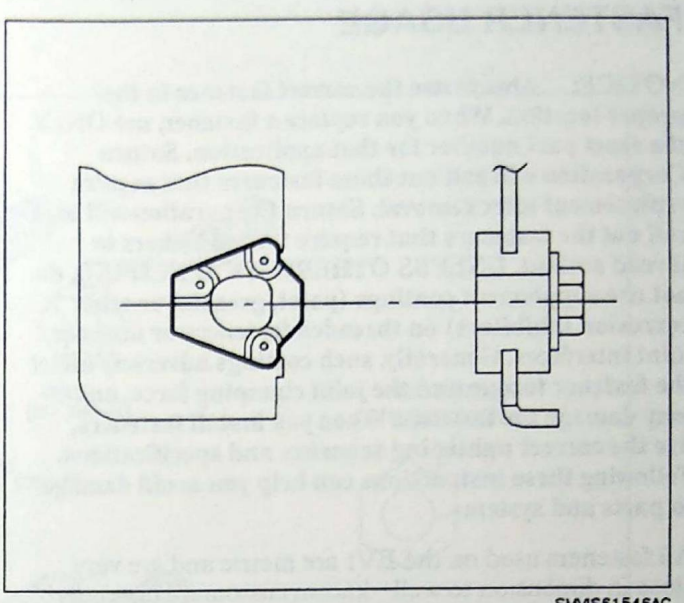
CHECKING THE STEERING COLUMN FOR ACCIDENT DAMAGE

NOTICE: Vehicles involved in accidents resulting in major body damage or where the steering column has been impacted may also have a damaged or misaligned steering column. Failure to check the steering column for damage may result in component malfunction.

1. Inspect the capsules on the steering column assembly; all must be securely seated in bracket slots and checked for any loose conditions when pushed or pulled. If any movement exceeds 1.59 mm (1/16 in.), replace column.



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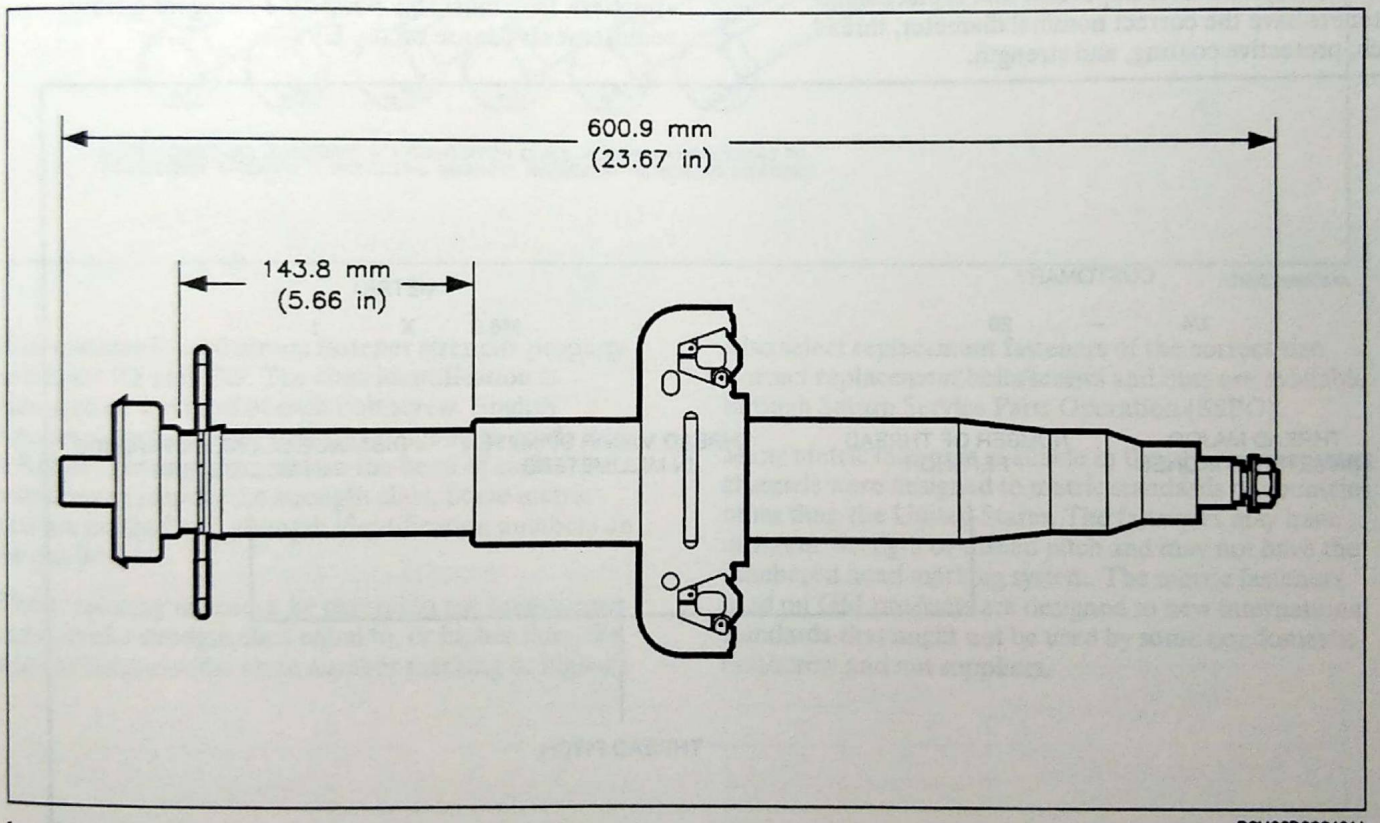

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2. Check the steering column jacket for collapse by measuring between the end of the bearing assembly and the lower edge of the upper bracket. If the dimension is less than 143.8 mm (5.66 in.), replace the jacket.

2. If the steering shaft is suspected of being bent, check the steering shaft runout in the following steps:

   a. Remove the inflator module, steering wheel, shrouds, and lever combination switch.

NOTE: Failure to remove the coil assembly before the steering shaft is rotated may damage the coil assembly.

   b. Remove the intermediate shaft.

   c. Install a dial indicator (SA9179NE) so that its plunger rests against the upper end of the steering shaft.

   d. Rotate the steering shaft while observing the dial indicator reading. If the total indicator travel shows that runout is more than 1.59 mm (1/16 in.), replace the steering column.

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FASTENER USAGE

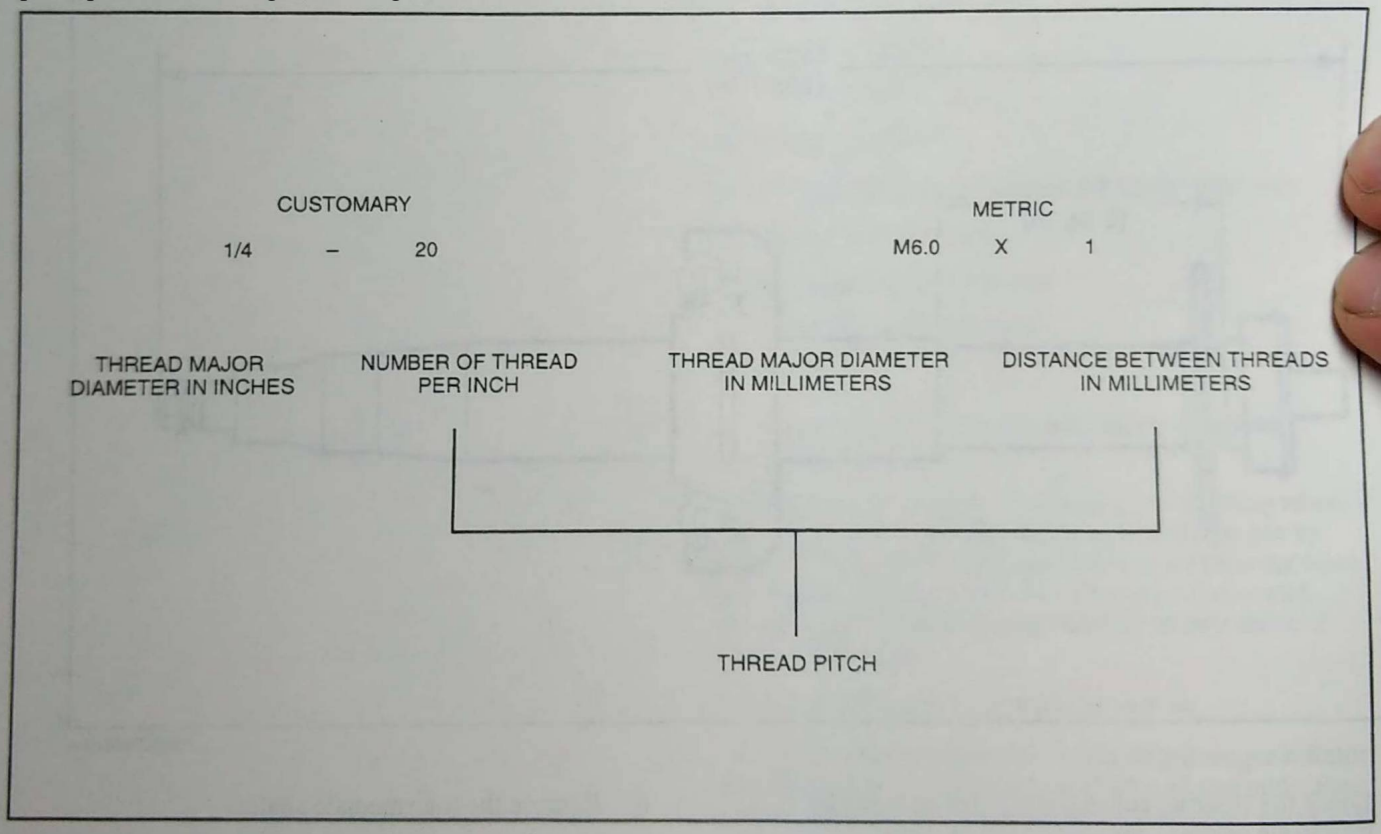
NOTICE: Always use the correct fastener in the proper location. When you replace a fastener, use ONLY the exact part number for that application. Saturn Corporation will call out those fasteners that require replacement after removal. Saturn Corporation will also call out the fasteners that require thread lockers or thread sealant. UNLESS OTHERWISE SPECIFIED, do not use supplement coatings (paint, greases, or other corrosion inhibitors) on threaded fasteners or fastener joint interfaces. Generally, such coatings adversely affect the fastener torque and the joint clamping force, and may damage the fastener. When you install fasteners, use the correct tightening sequence and specifications. Following these instructions can help you avoid damage to parts and systems.

All fasteners used on the EVi are metric and are very close in dimension to well-known customary' fasteners in the inch system. It is important that replacement fasteners have the correct nominal diameter, thread pitch, protective coating, and strength.

Original equipment metric fasteners, identified by a number marking, show the strength of the material on the fastener. Some beauty fasteners, such as exposed retainer clips and cross-recess head screws may not be identified.

The most commonly used metric strength property classes are 9.8 and 10.9 with the class identification embossed on the head of each bolt. Some metric nuts are marked with strength identification numbers on the nut face. It is extremely important to select replacement fasteners that are designed for the application. Each fastener has been selected to meet performance goals for each joint. The fastener strength, diameter, thread pitch, finish, length, head type and diameter are all equally important variables. Any deviation from the specified replacement part could jeopardize joint integrity.

Saturn Service Parts Organization (SSPO) is a supplier of high quality original equipment replacement fasteners for EVi. If fasteners are purchased from aftermarket suppliers, they must also posses the stringent quality requirements for use on the EVi



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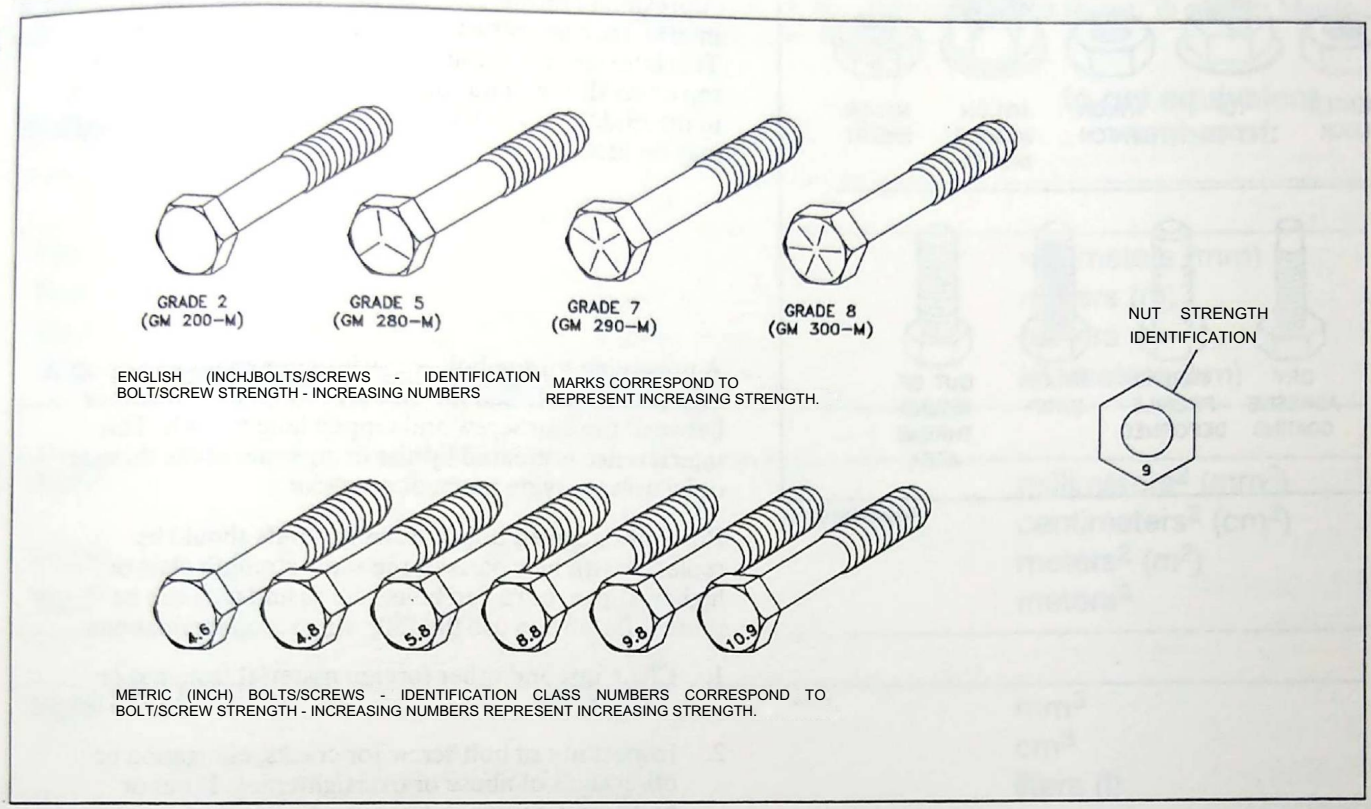
FASTENER STRENGTH IDENTIFICATION



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Most commonly used metric fastener strength property classes are 9.8 and 10.9. The class identification is embossed on the head of each bolt/screw. English fastener strength property classes range from grade 2 to 8. Radial lines are embossed on the head of each bolt/screw to identify the strength class. Some metric nuts are marked with strength identification numbers on the nut face.

When replacing fasteners, be careful to use bolts/screws and nuts of a strength class equal to, or higher than, the original fasteners (the same number marking or higher).

Also select replacement fasteners of the correct size. Correct replacement bolts/screws and nuts are available through Saturn Service Parts Operation (SSPO).

Many metric fasteners available in the aftermarket parts channels were designed to metric standards of countries other than the United States. The fasteners may have different strength or thread pitch and may not have the numbered head marking system. The metric fasteners used on GM products are designed to new international standards that might not be used by some nondomestic bolt/screw and nut suppliers.

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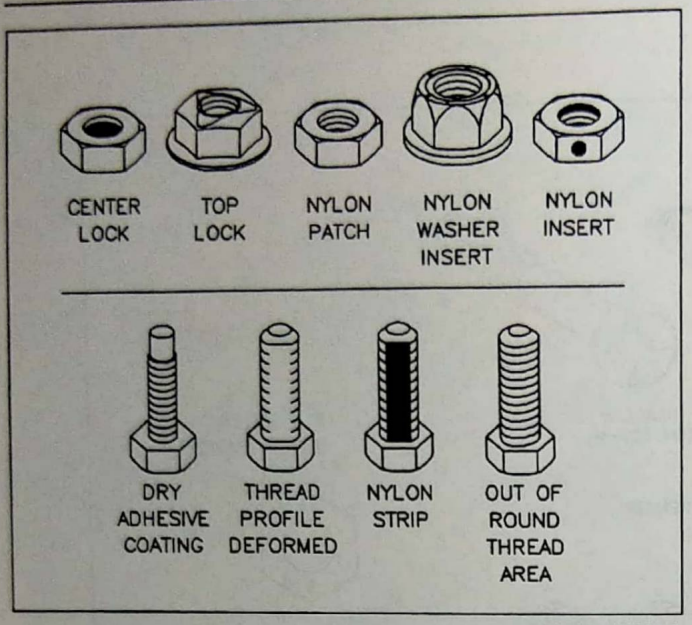

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PREVAILING TORQUE FASTENERS

A prevailing torque nut is designed to develop a interference between the nut and bolt/screw threads. This interference is usually created by distortion of the top of an all-metal nut or by a nylon patch in the threads in the middle of a hex flat. In other cases, a nylon insert may be used.

A prevailing torque bolt/screw is designed to develop an interference between the bolt/screw and nut threads or between the bolt/screw and tapped hole threads. This interference is created by distorting some of the threads or by using a nylon patch or adhesive.

Rusty or damaged bolts/screws and nuts should be replaced with new parts of the same strength class or higher. Clean, unrusted bolts/screws and nuts can be reused. Be sure to use the following recommendations:

1. Clean dirt and other foreign material from nut or bolt/screw.
2. Inspect nut of bolt/screw for cracks, elongation or other signs of abuse or overtightening. If nut or bolt/screw is worn in any way, replace with a nut or bolt/screw of the same strength class or higher.
3. Assemble the parts and hand-start nut or bolt-screw.
4. Check that nut or bolt/screw fails to develop the proper torque before it seats. If nut or bolt/screw fails to develop torque correctly, replace with a nut or bolt/screw of the same strength class or higher.
5. Tighten fastener to the torque specified in the appropriate installation procedure in this manual.

FASTENER TYPE	TORQUE UNITS	METRIC-SIZE FASTENERS							
		6	6.3	8	10	12	14	16	20
NUTS AND ALL METAL BOLTS/SCREWS	N*m	0.4	0.4	0.8	1.4	2.2	3.0	4.2	7.0
	Lb. In.	4	4	7	12	19	27	37	62
ADHESIVE OR NYLON COATED BOLTS/SCREWS	N*m	0.4	0.4	0.6	1.2	1.6	2.4	3.4	5.6
	Lb. In.	4	4	5	11	14	21	30	50
FASTENER TYPE	TORQUE UNITS	INCH-SIZE FASTENERS							
		.250	.312	.375	.437	.500	.562	.625	.750
NUTS AND ALL METAL BOLTS/SCREWS	N«m	0.4	0.6	1.4	1.8	2.4	3.2	4.2	6.2
	Lb. In.	4	5	12	16	21	28	37	55
ADHESIVE OR NYLON COATED BOLTS/SCREWS	N*m	0.4	0.6	1.0	1.4	1.8	2.6	3.4	5.2
	Lb. In.	4	5	9	12	16	23	30	49

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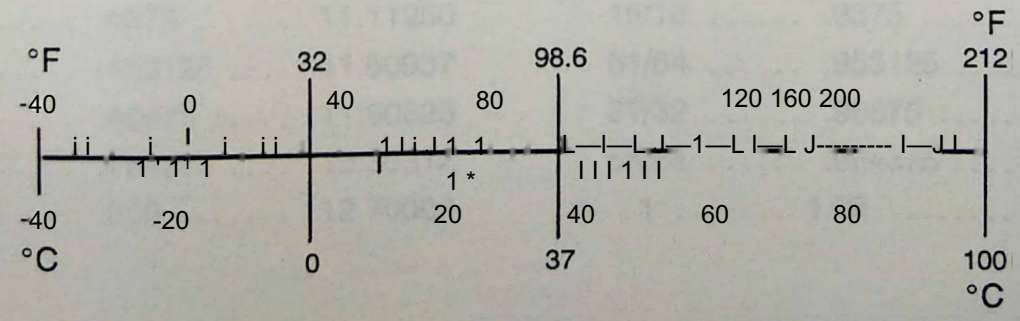
ENGLISH-METRIC CONVERSIONS

To convert English units to Metric units, multiply the English units by the conversion factor shown. To convert Metric units to English units, divide the Metric units by the conversion factor shown.

Multiply	by	to get equivalent number of:
	LENGTH	
Inch	25.4	millimeters (mm)
Foot	0.304	meters (m)
Yard	0.914	meters
Mile	1.609	kilometers (km)
	AREA	
$Inch^2$	645.2	$millimeters^2$ (mm^2)
	6.45	$centimeters^2$ (cm^2)
$Foot^2$	0.092	$meters^2$ (m^2)
$Yard^2$	0.836	$meters^2$
	VOLUME	
$Inch^3$	16 387.0	mm^3
	16.387	cm^3
	0.016	liters (l)
Quart	0.946	liters
Gallon	3.785	liters
$Yard^3$	0.764	$meters^3$ (m^3)
	MASS	
Pound	0.453	kilograms (kg)
Ton	907.18	kilograms (kg)
Ton	0.907	tonne (t)
	FORCE	
Kilogram	9.807	newtons (N)
Ounce	0.278	newtons
Pound	4.448	newtons
	TEMPERATURE	
Degree Fahrenheit (°F)	(°F-32) +1.8	Degree Celsius (C)



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ENGLISH-METRIC CONVERSIONS (CONTINUED)

Multiply	by	to get equivalent number of:
ACCELERATION		
Foot/sec^2	0.305	meter/sec^2 (m/s^2)
Inch/sec^2	0.025	meter/sec^2
TORQUE		
Pound-inch	0.113	newton-meters (N»m)
Pound-foot	1.356	newton-meters
POWER		
Horsepower	0.746	kilowatts (kW)
PRESSURE OR STRESS		
Inches of water	0.248	kilopascals (kPa)
Pounds/sq. in.	6.895	kilopascals
ENERGY OR WORK		
BTU	1 055.000	joules (J)
Foot-pound	1.356	joules
Kilowatt-hour	3 600 000. or 3.6 x 10^6	joules (1 joule = one watt-second)
LIGHT		
Foot candle	10.76	lumens/meter^2 (lm/m^2)
FUEL PERFORMANCE		
Miles/gal	0.425	kilometers/liter (km/l)
Gal/mile	2.353	liter/kilometer (l/km)
VELOCITY		
Miles/hour	1.609	kilometers/hr. (km/h)

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DECIMALAND METRIC EQUIVALENTS

Fractions	Decimal In	Metric MM
1/64	.015625	.39688
1/32	.03125	.79375
3/64	.046875	1.19062
1/16	.0625	1.58750
5/64	.078125	1.98437
3/32	.09375	2.38125
7/64	.109375	2.77812
1/8	.125	3.17500
9/64	.140625	3.57187
5/32	.15625	3.96875
11/64	.171875	4.36562
3/16	.1875	4.76250
13/64	.203125	5.15937
7/32	.21875	5.55625
15/64	.234375	5.95312
1/4	.250	6.35000
17/64	.265625	6.74687
9/32	.28125	7.14375
19/64	.296875	7.54062
5/16	.3125	7.93750
21/64	.328125	8.33437
11/32	.34375	8.73125
23/64	.359375	9.12812
3/8	.375	9.52500
25/64	.390625	9.92187
13/32	.40625	10.31875
27/64	.421875	10.71562
7/16	.4375	11.11250
29/64	.453125	11.50937
15/32	.46875	11.90625
31/64	.484375	12.30312
1/2	.500	12.70000

Fractions	Decimal In	Metric MM
33/64	.51625	13.09687
17/32	.53125	13.49375
35/64	.546875	13.89062
9/16	.5625	14.28750
37/64	.578125	14.68437
19/32	.59375	15.08125
39/64	.609375	15.47812
5/8	.625	15.87500
41/64	.640625	16.27187
21/32	.65625	16.66875
43/64	.671875	17.06562
11/16	.6875	17.46250
45/64	.703125	17.85937
23/32	.71875	18.25625
47/64	.734375	18.65312
3/4	.750	19.05000
49/64	.765625	19.44687
25/32	.78125	19.84375
51/64	.796875	20.24062
13/16	.8125	20.63750
53/64	.828125	21.03437
27/32	.84375	21.43125
55/64	.859375	21.82812
7/8	.875	22.22500
57/64	.890625	22.62187
29/32	.90625	23.01875
59/64	.921875	23.41562
15/16	.9375	23.81250
61/64	.953125	24.20937
31/32	.96875	24.60625
63/64	.984375	25.00312
1	1.00	25.40000

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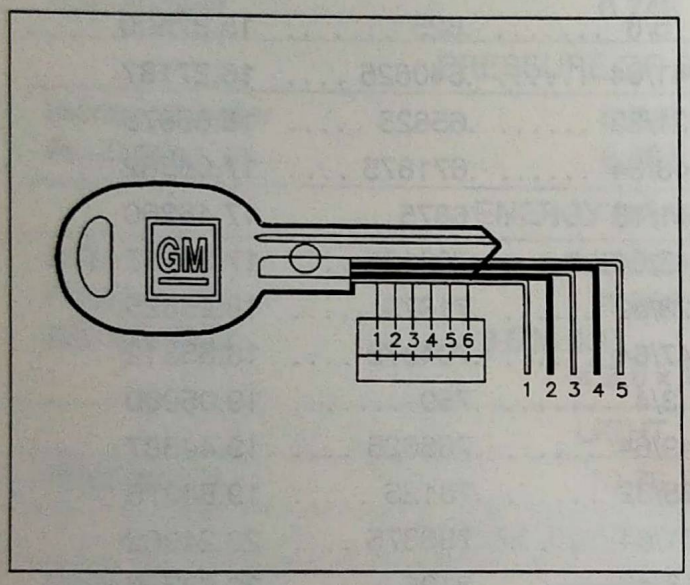
KEY AND LOCKS

KEY IDENTIFICATION AND USAGE

The EVi lock cylinder keyway is designed so that most other key blanks will not enter a current model lock cylinder. One single cut oval-headed key is used for all lock cylinders on the EVi.

Key identification is obtained from the four-character key code stamped on the knockout portion of the keyhead and from the blank code identification letter "H" stamped on the key shank. From these numbers, the lock combination can be determined by use of a code list, which is available to owners of key cutting equipment from equipment suppliers.



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DECIPHERING THE LOCK CODE

The Saturn approved key cutting tool has a key code book provided with it. The customer information card or the retailers records will show the key code as an alphanumeric four character code. To determine the actual cut sequence of the key from this code, look up the code in the code book and the cut sequence will be shown to the right of the code listing. The *master* cut sequence should be used to cut new keys, as it has all of the cuts necessary for the key to work properly in all the locks on the vehicle.

If the numbers are not available from records or from the knockout plug, lock combinations (tumbler numbers and position arrangement) can be determined by laying the key on the key code diagram provided.

The key code can also be determined by using a Saturn approved key cutting tool. Simply insert the key in the Saturn approved key cutting tool with the cutting die in the down position, move the carriage toward the die until it bottoms out. With the key in the bottomed out position, read the depth dial for that particular cut. Repeat this for all cut positions, writing down the sequence as you proceed, and you will have correctly read the cut sequence of the key.

CUTTING KEYS

1. Determine special code from the code list or key.
2. Cut a blank key to proper level for each of six tumbler positions or according to directions supplied by the key-cutting equipment manufacturer.
3. Check key operation in lock cylinder.

REPLACEMENT LOCK CYLINDERS

New lock cylinders are available from Saturn service parts with a new lock cylinder locking bar. Tumblers an springs are also available and must be assembled into the cylinder.

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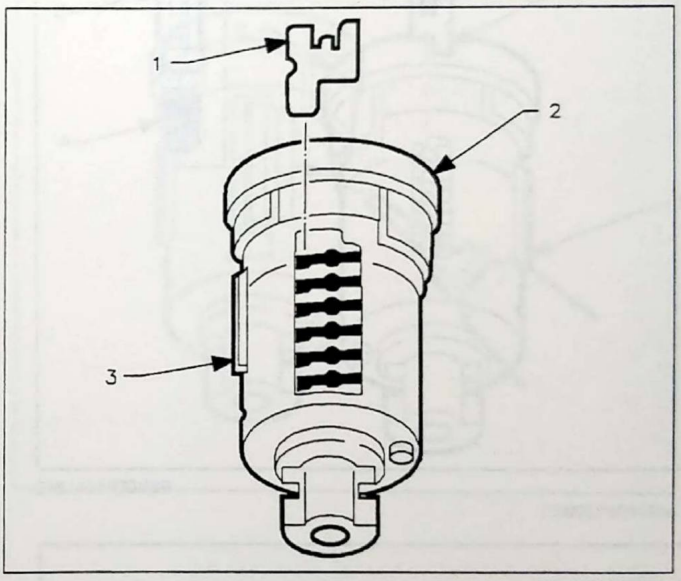
DOOR LOCK SYSTEM PERFORMANCE

In order to properly evaluate the lock system after a replacement part has been installed, the following operational checks should be made.

1. Insert kc> into c\ linder. W bile holding the key in the neutral (pull-out) position, actuate the inside locking button to the fully locked position and back to the fully unlocked position. There must be no forced movement of the key out of neutral position during the entire cycle. (The key must be able to be removed when the inside locking button is held in both the fully locked and unlocked positions.)
2. Turn key to fully locked position and return it to the neutral (pull-out) position. Actuate either the inside or outside handle to ensure that the door will not open.
3. Turn key to the fully unlocked position and return it to the neutral (pull-out) position. Actuate either the outside or inside handle to ensure that the door will open.

LOCK CYLINDERS CODING

Tumblers (1) for all locks are shaped alike, with the exception of the notch position on one side. As the key is inserted in the lock cylinder (2), tumblers (1) are lowered to the correct height so that notches on each tumbler (1) are at the same level. When the notches on all six tumblers line up. the side bar (3) is pushed into the notches by two small springs. This allows the lock cylinder (2) to turn in its bore. Five types of tumblers (1) are used to make the various lock combinations. Each tumbler (1) is coded according to a number, one through five, stamped on its side.



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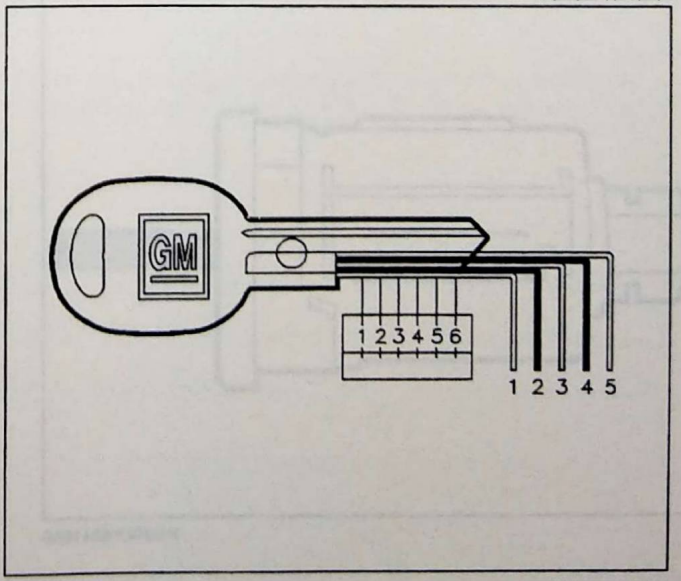
ASSEMBLY

1- Find lock cylinder tumbler numbers and tumbler arrangements by use of a numerical key code lock cylinder code list. Code lists are made available to owners of key cutting equipment suppliers. If code list is not available, proceed as follows:

   a. Lay key on the key code diagram with key outlined by diagram.

   b. Starting at the head of the key blade, find and record the lowest level (tumbler number) that is visible in position number 1 and subsequent position numbers 2 through 6. After tumbler numbers and arrangements have been determined, assemble as follows:



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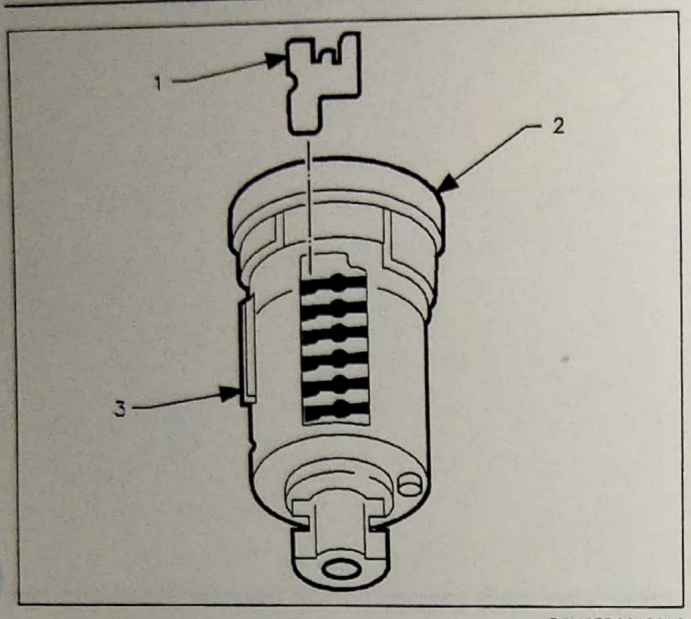

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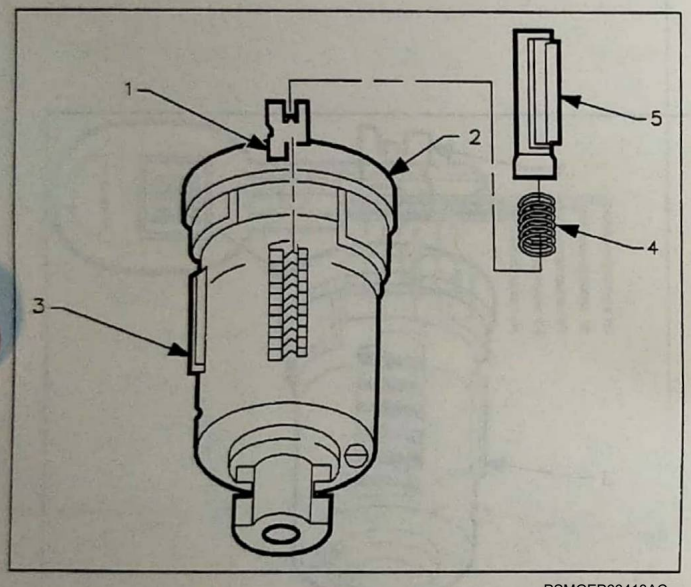
2. Starting at opened end of cylinder (2), insert tumblers (1) in proper slots in order called by the code.

3. Pull out side bar (3) with fingers so that tumblers win drop completely into place.



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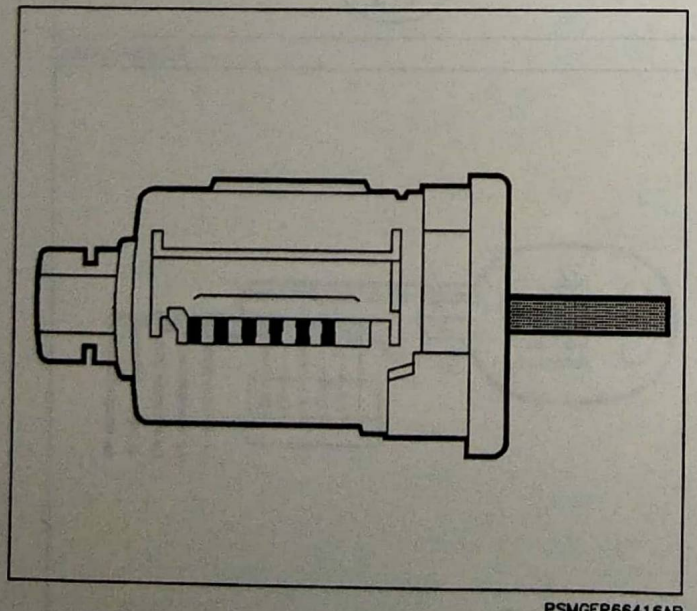
IMPORTANT: If the springs become tangled, do not pull them apart. Unscrew them or they may be damaged. Insert one tumbler spring (4) in the space provided above each number.

4. Insert spring retainer (5) so that the two end prongs slide into slots at either end of the cylinder and press retainer down. If tumblers have not been assembled correctly, they can be removed from the cylinder by holding the cylinder with the tumbler slots down, pulling the side bar out with your fingers and jarring the cylinder to shake tumblers out. This procedure is necessary because once the tumblers have been pressed down into the cylinder, they are held in their slots by the side bar.



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5. To check if tumblers have been properly installed, insert key into lock cylinder. If tumblers are installed properly, the side bar will drop down. If bar does not drop down, remove key, spring retainer, springs and tumblers, and reassemble.

IMPORTANT: Use leather or wood at each vise jaw to prevent damage to cylinder.

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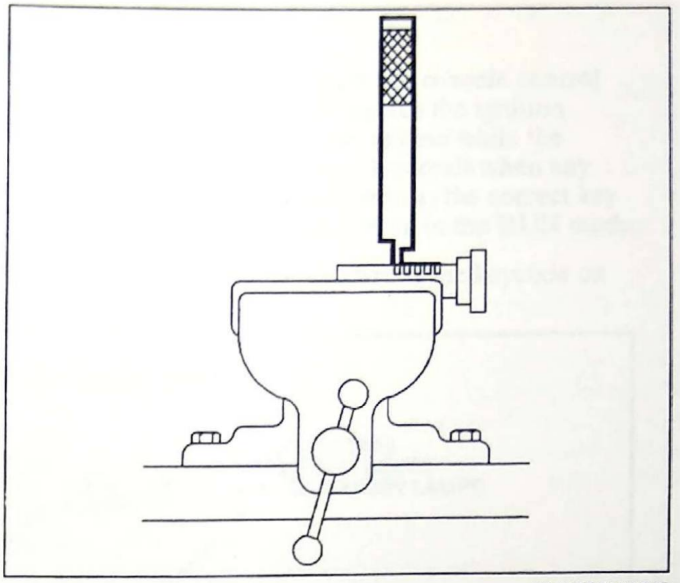
6. If the cylinder is assembled properly, remove key and secure cylinder in a vise with spring retainer exposed.

7 Using suitable staking tool, stake spring retainer securely in place by staking cylinder metal over retainer at each end.



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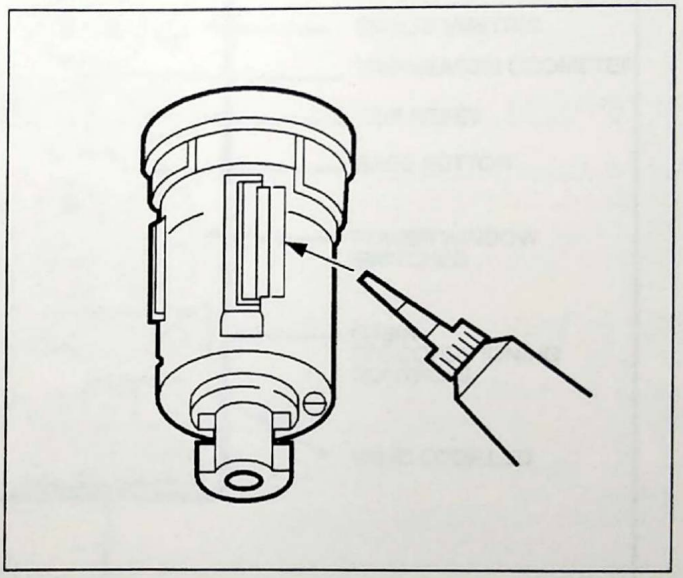
8. Lubricate cylinder with a light oil or graphic lubricant. Never use a silicon spray lubricant.



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LOCK SERVICE KIT

EVi lock service parts arc individually packaged for ea of serviceability. Both the door and rear compartment n lock cylinder service units are available this way. The Jock cylinder service units have all the parts necessary to build up a lock cylinder except the tumblers and the tumbler springs. Tumblers and springs are also serviced separately to build up the lock cylinder service unit to the customer's original key code. (To determine the vehicle key code, refer to the "Key Identification and Usage" of this section.)

These parts are provided so that the retailer will have the components necessary, at all times, to service EVi lock system and maintain its *one key* integrity for the EVi customer.

LOCK CYLINDER LUBRICATION

Lubricate the lock cylinders with a light oil or graphite lubricant. Never use a silicon spray lubricant.

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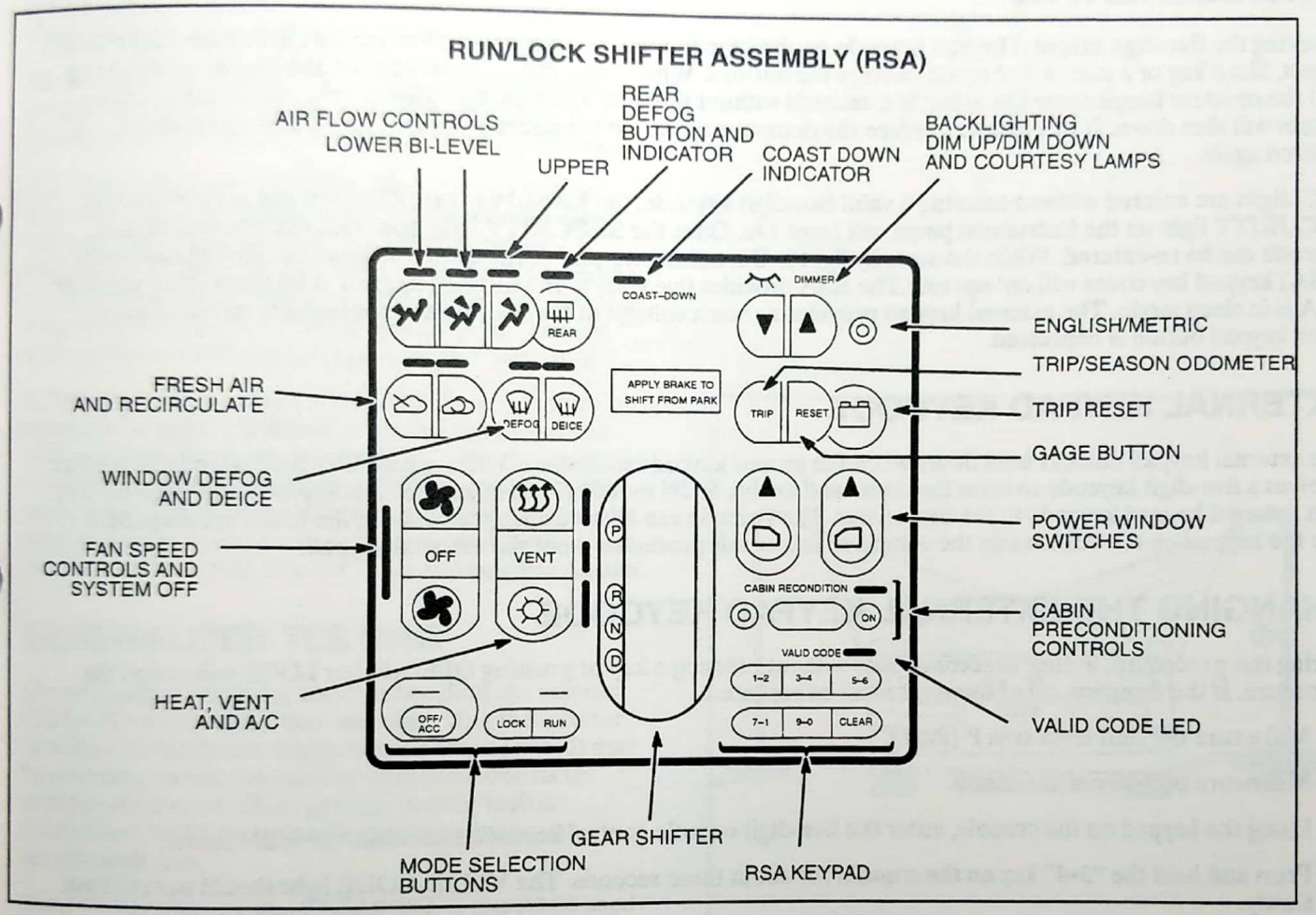
CONSOLE CONTROL KEYPAD

The E/1renhScnes?heVnlitiSi1kev and^ S 'gn',io"switch like a conventional vehicle. Instead, the console control kCYt h Tn enter the RUN mode on the FVi TMode selection buttons on the console replace the ignition 5Wltc? backlig i -■ on (The backliffhtino will r CU Cr/^e Eve-digit console control keycode on the keypad while the , , .pH- AX ? come on for a minute when a door is opened and for 10 seconds when any Run Lock Shifter Assemb y^(RSA/ button is pressed.) The valid code LED should come on as soon as the correct key code is en • P u on. The RUN LED should come on and the vehicle will be in the RUN mode.

When a new E\ l is delivered, the retailer programs the five-digit console control keycode and writes the keycode on the key tag.



CHANGING THE CONSOLE CONTROL KEYCODE

The five-digit console control keycode can be changed using the following procedure. During this procedure, letting 10 seconds pass without pressing a key or pressing "OFF/ACC" or "LOCK" will cancel the procedure. If this happens, all of the steps must be repeated.

T Make sure the shift lever is in "P" (Park).

2- Make sure both doors are closed.

3- Using the keypad on the console, enter the current five-digit console control keycode and select the "RUN" mode.

4- Press and hold the "1*2" key for about three seconds. The "VALID CODE" light should start to flash slowly.

5- Enter the new five-digit console control keycode. Once all five-digits have been entered, the "VALID CODE" light should stop flashing and remain On for about two seconds.

If a mistake is made before all five disits have been entered, press "CLEAR." The digits entered will be erased. Step 5 can then be repeated.

6- Wait for the "VALID CODE" light to flash slowly again.

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console control keycode again. Once all five digits have been entered again, the two seconds.

" light should stop flashing

VAUD CODE" ugh. O« out. it ntesns the old keycode has been erased and the new eonsote control kewdc can be used.

■« ctnn 7k not the same new keycode entered in step 5, try to enter it two more time-, [f th- k 'rodIshmmatched after three attempts, the console control keycode will not be changed. All of these steps would have to be repeated to change the console control keycode.

EXTERNAL KEYPAD

Entering the five-digit external keypad keycode on the keypad unlocks both doors. Don t press the buttons with a hard obiect like a key or a pen as that could damage the buttons. When using the external keypad, the keypad backlighting and the courtesy lamps come On. After five seconds without pressing a button, the keypad light will go out and the system will shut down. If this happens before the doors are unlocked the entire external keypad keycode must be entered again.

If 25 digits are entered without entering a valid five-digit keycode, the keypad will turn Off for three minutes and the SECURITY light on the instrument panel will come On. Once the SECURITY light goes Off, the external keypad keycode can be re-entered. While the security light is On, neither keypad or the external Run/Lock Shifter Assembly (RSA) keypad key codes will not operate.The RSA provides five volts to the external keypad at all times, even when the RSA is in sleep mode. The external keypad provides a return voltage to the RSA on the appropriate circuit when a given keypad button is depressed.

EXTERNAL KEYPAD KEYCODE

The external keypad unlocks both doors when the proper keycode is entered. When a new EVi is delivered, the retailer receives a five-digit keycode to open the doors and enable RUN mode. The retailer files this keycode and gives the five-digit external keypad keycode to the first owner. The keycode can then be changed by using the following procedure. Use the keypad on the RSA inside the vehicle to follow this procedure—not the external keypad.

CHANGING THE EXTERNAL KEYPAD KEYCODE

During this procedure, letting 10 seconds pass without pressing a key or pressing OFF/ACC or LOCK will cancel the procedure. Lf this happens, all of the steps must be repeated.

1. Make sure the shift lever is in P (Park).
2. Make sure both doors are closed.
3. Using the keypad on the console, enter the five-digit console control keycode and select the RUN mode.
4. Press and hold the “3«4” key on the console for about three seconds. The VALID CODE light should start to flash slowly.
5. Enter the five-digit new external keypad keycode. Once all five digits have been entered, the VALID CODE lisht should stop flashing and remain On for about two seconds.

If you make a mistake before all five digits have been entered, press CLEAR. The digits you entered will be erased, and you can then repeat step 5.

6. Wait for the VALID CODE light to flash slowly again.
7. Enter the five d keypad keycode a ain- Once all five digits have been entered again, the VALID CODE light should stop flashing and remain On for about two seconds.

When the VAL D C light keycode canbe^used^^^ &°cS °Ut’ ** means tbe °^d keycode has been erased and the new external keypad

If the keycode entered in step 7 is not e new code isnh matched afterthree atternnt^th^^ ^eycode entered in step 5, try to enter it two more times. If the key to be repeated to change the externa? keyp^ad^key?ode eyPad keyC°de WiH nOt be chanSed- All of these stePs would haV£ 42

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WATERLEAKS

DIAGNOSIS AND REPAIR

The EVl is designed to operate under normal environmental conditions. The design criteria for sealing materials and components takes into consideration the " sealing forces required to withstand the natural elements. These specifications do not, and cannot, take into consideration all artificial conditions such as what may be encountered in some high pressure car washes.

The watertest procedure has been designed to simulate natural elements and will determine the ability of a vehicle to perform under normal operating conditions.

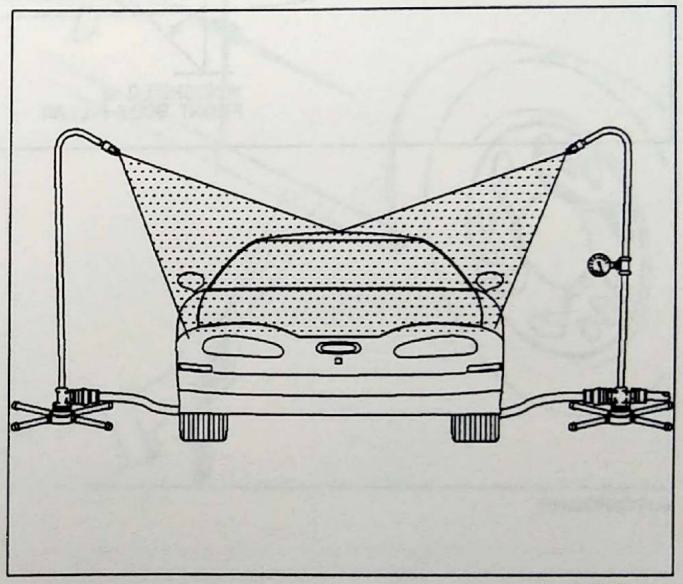
Repairing body waterleaks consists of proper testing, diagnosis and repair through adjustment of misaligned components and/or application of proven repair materials. The first step in w-aterleak diagnosis is finding the conditions under which the leak occurs. For example, if the leak is noticed only when parked on an inclined drive or there is water in the rear compartment area.

If the general leak area can be found, the exact entry point can be quickly isolated by use of a localized test such as a water hose or air hose. If the leak source is not obvious, the generalized testing method using watertest equipment such as the watertest stands shown should be used. It may be necessary to remove some interior trim panels or components to locate leak and confirm repairs.

GENERALIZED TESTING

Generalized watertesting involves flooding the exterior surface of vehicle with water and observing the interior of vehicle to determine where water entry occurs. It may be necessary to remove interior trim components to observe water entry. Once general area of leak is determined, move on to localized testing to locate specific leak area.

Saturn waterleak test stand #SA9408NE should be used for generalized testing to assure thorough vehicle testing without subjecting the vehicle to abnormal water pressure.



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WATERTEST STAND SPECIFICATIONS

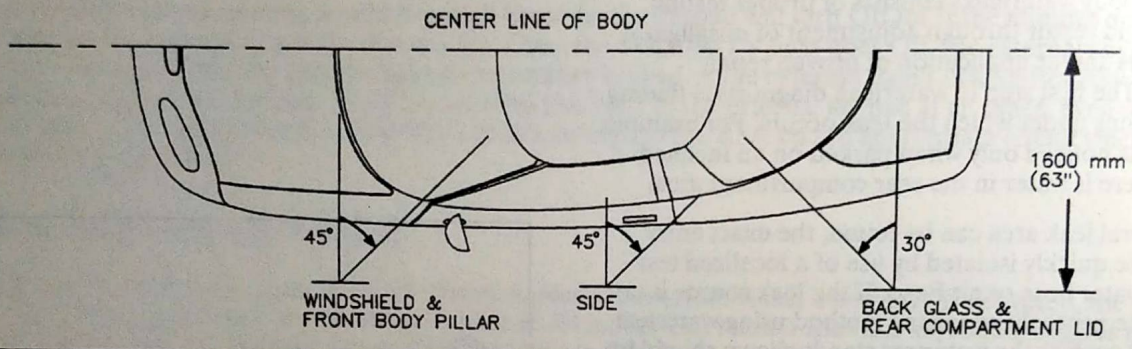
WATERTEST STAND SPECIFICATIONS

TYPE OF NOZZLE	-FULL CONE SPRAY WITH 60 INCLUDED ANGLE - "FULL JET' SPRAY NOZZLE NO. 1/2 GG-25 OR EQUIVALENT.
NOZZLE HEIGHT	-APPROXIMATELY 1 600mm (63") FROM FLOOR
VOLUME OF FLOW	-14 LITERS (3.7 GALLONS) PER MINUTE
PRESSURE	-155 kPa (22 PSI) MEASURED AT NOZZLE

WINDSHIELD AND FRONT BODY PILLAR - APPROXIMATELY 30 DEGREES DOWN, 45 DEGREES TOWARDS REAR AND AIMED AT CORNER OF WINDSHIELD

SIDE - APPROXIMATELY 30 DEGREES DOWN, 45 DEGREES TOWARDS REAR AND AIMED AT CENTER OF REAR DOOR OR REAR QUARTER.

BACK WINDOW AND REAR COMPARTMENT LID - APPROXIMATELY 30 DEGREES DOWN, 30 DEGREES TOWARDS FRONT AND AIMED APPROXIMATELY 600 mm (24") FROM CORNER OF BACK WINDOW.



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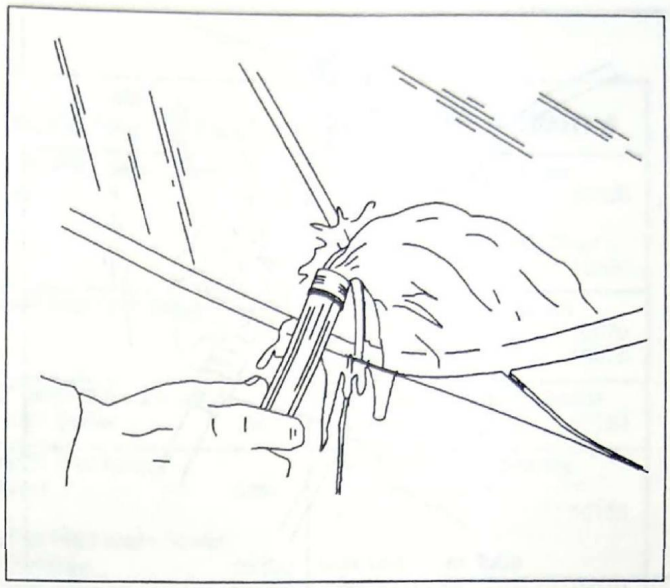
LOCALIZED TESTING (SPOT TEST)

Localized testing may be done with either water or air Begin test at the base of the suspected area and rn„7 up slowly until the leak is located. d COntlnue

IMPORTANT: Pinpoint the leak area before any reoair is made. Random repair may only temporarily restrict water entn and make future diagnosis and repair more difficult. H more

Continue localized testing in the same general area tn confirm that all leaks have been located



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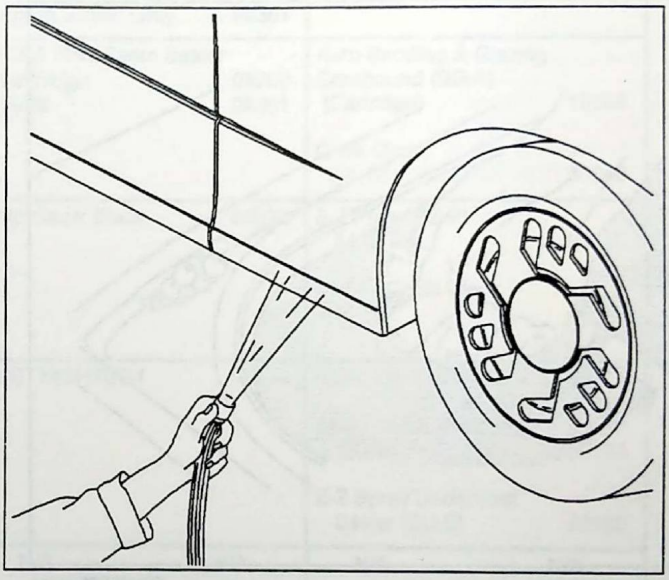
WATER HOSE TEST

- Have a helper inside the vehicle to detect the actual leak point.
- Use unrestricted water flow (no nozzle).
- Begin at base of suspected leak area and move upward slowly.



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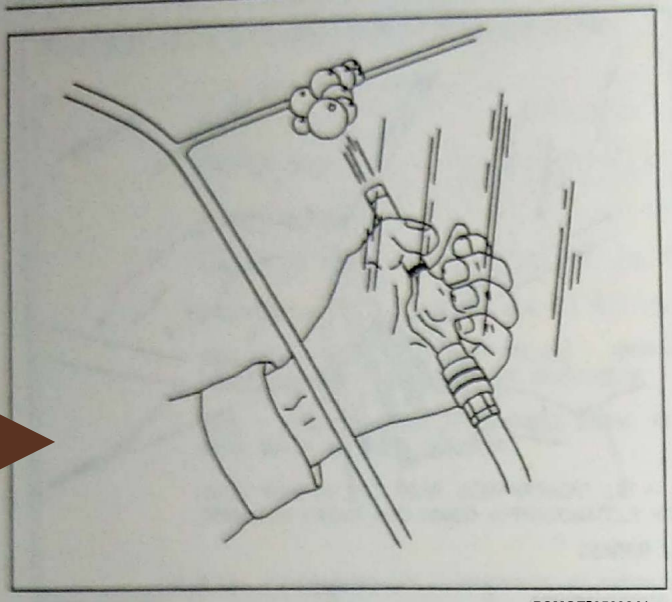

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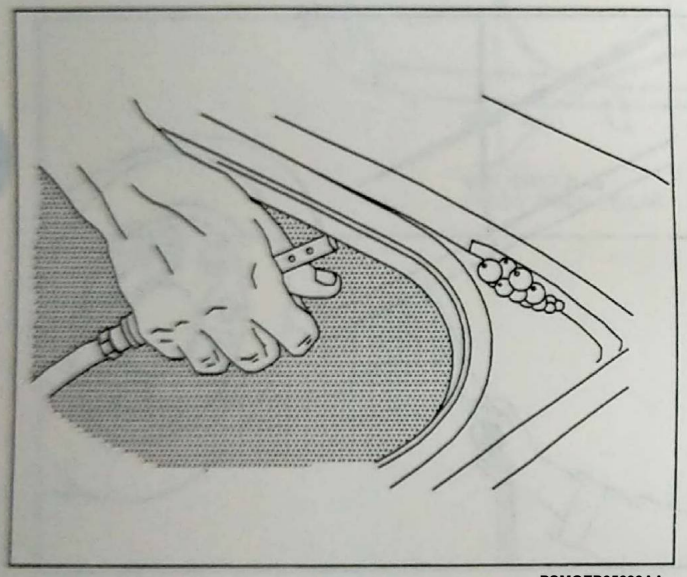
AIR HOSE TEST

- Apply bubble solution (liquid soap and water) to suspected area.
- Apply air pressure with an air hose from inside the vehicle. Do not exceed 205 kPa (30 psi).
- Observe for bubbles on outside at suspected leak area.



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WATERLEAK REPAIR

To locate the exact leak point or to repair the leak, it may be necessary to remove some interior trim panels or components.

After completion of any waterleak repair, the general area should be retested using the watertest stand. Do not use air hose or water hose to test repaired areas as the repair material may dislodge under abnormal pressure application.

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BODY **SEAM SEALER**

PURPOSE OF PRODUCT	SSPO NAME	PART#	3M™ TRADE NAME	3M™ PART #	KENT TRADE NAME	KENT PART #
T'ciear body seam sealer, can t»e mixed with paint to match color of vehicle to eliminate painting	N/A	N/A	ULTRA PRO Seam Sealer Tube	08302	WET/DRY Quik Leak Chek Tube (LC-C) HIGH TECH Leak Chek Clear Tube (HT-C)	10500 10200
2 Fio-orade body seam sealers that can be painted.	N/A	N/A	Heavy Drip-Chek Sealer	08531	HIGH TECH Seam Sealers Black (HT-B) Neutral (HT-N)	10070 10075
3. A brushable body seam sealer.	N/A	N/A	ULTRA PRO Brushable Seam Sealer	08655	Brushable White Seam Sealer (B4-S)	10120
4 A medium body sealer for sealinc interior or exterior joints and voids. Resists body vibration, adheres to clean bare metal, primed and/or Damted surfaces Is paintable in a short period of time.	N/A	N/A	Fast 'N Firm Seam Sealer ULTRA PRO Seam Sealer Cartridge Tube ULTRA PRO Urethane Seam Sealer Gray	08505 08300 08301 08361	HIGH TECH Seam Sealers Cartridge Grade Black (CHT-1) Quik Leak Chek Tube Black (LC-B) Clear Cartridge (CL-C)	10105 10510 30040
5 For seating seams and voids that do not have to be painted. Remains soft and flexible without shrinking.	N/A	N/A	ULTRA PRO Seam Sealer Cartridge Tube	08300 08301	Auto Bedding & Glazing Compound (BG-1) (Cartridge) Chek Clear (CL-C)	10255 30040
6. A thumb grade strip-caulk for sealing large gaps and filling voids, etc . wil. remain soft and pliable.	N/A	N/A	Strip Caulk Black	08578	E-Z Putty (EZ-P) 3 Lb. Tub Seal n* Caulk Black (SP-1)	90120 10310
7. Ar, anti-corrosion coating with wickina capabilities for internal body seams.			RUST FIGHTER-I	08892	Spray Leak Chek (SL-C) Spray Black Undercoat (SB-U) E-Z Spray Undercoat Sealer (SU-S)	50265 50195 50150
8 A urethane adhesive for installation of roof panels to space frame.	Urethane Glass Adhesive Caulking Kit1	2345633	N/A	N/A	N/A	N/A

NOTE: The above charts can be used as a quick reference regarding repair products for EVl vehicles. They are not intended to replace any manufacturer's product label directions.

'The reference information does not constitute an endorsement by Saturn of any manufacturer's product. Not all items have been subjected to Saturn Laboratory tests. Listed materials are recommended by each supplier for the purpose described.

The product information is based on the latest data available at the time of publication approval. The right is reserved to make product or publication changes at any time, without notice.

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GLASS

PURPOSE OF PRODUCT	SSPO NAME	PART #	3M® TRADE NAME	PART #	KENT TRADE NAME	PART #
1. Glass cleaner for clearing windows.	Glass Cleaner	21070063	N/A	N/A	N/A	N/A
2 For priming glass and pinchwelds prior to installation of windshields, back windows, or stationary quarter glasses. Prevents rusting.	INCLUDED IN URETHANE GLASS ADHESIVE CAULKING KIT	N/A	Super Fast Urethane Primer WINDO-WELD Primer	08608 08643	Prime-n'-Seal (PP-B) Urethane Primer (UP-C)	10550 10230
3 A urethane adhesive for " windshield, stationary glass and back window installations. A cleaner for removing adhesives after window installations that will not harm oaint. Urethane adhesive for repair of stationary glass water leaks.	Urethane Glass Adhesive Caulking Kit	12346284	N/A	N/A	N/A	N/A
4. A urethane adhesive for stationary glass waterleak repair.	Urethane Glass Adhesive Caulking Kit	12346284	N/A	N/A	N/A	N/A
5. A pumpable heavy body non-curing black sealer.	N/A	N/A	WINDO-WELD Resealant	08634	Glass Mastic (GM-1) Pint	10220
6. Stationary glass resealant; flows easily in pinholes and crevices. Adheres to glass, Daint and synthetic rubber sealers.	N/A	N/A	WINDO-WELD Resealant Flo-Grade Cartridge Grade	08633 08634	HIGH-TECH Clear Sealant WET/DRY RESEALANT Pump Grade (RW-D) LEAK SEAL WET/DRY Resealant Cartridge (CW-D) URESEAL (US-R) Flowable	10200 10590 10570 10589

WEATHERSTRIPS

PURPOSE OF PRODUCT	SSPO NAME	PART#	3M® TRADE NAME	PART #	KENT TRADE NAME	PART#
1. A special solvent blend that softens the adhesive bond between weatherstrip and meta'. Will not harm paint finish.	N/A	N/A	Release Agent General Purpose Adhesive Cleaner	08971 08984	Special Release Agent (SR-A) ACRYSOL (AB-S)	30125 20005
2. An adhesive for installing weatherstrips.	N/A	N/A	Weatherstrip Adhesive Tube	08011	STICK-IT (SI-B)	10180
3. A silicone lubricant in paste or aerosol foam that provides all-season protection of rubber and plastic, prevents squeaks and sticking.	N/A	N/A	Silicone Lubricant Plus Aerosol 3M® Paste Silicone	08936 08946	Silicone Lube Compound Paste (K44) Aerosol Lube Compounds 100% Silicone (S-46)	50015 50035
4. A powder for pinpointing voids between the weatherstrip and 1 the body.	N/A	N/A	Leak Detection Powder	08951	Spray Tracing Powder (ST-P)	20065J

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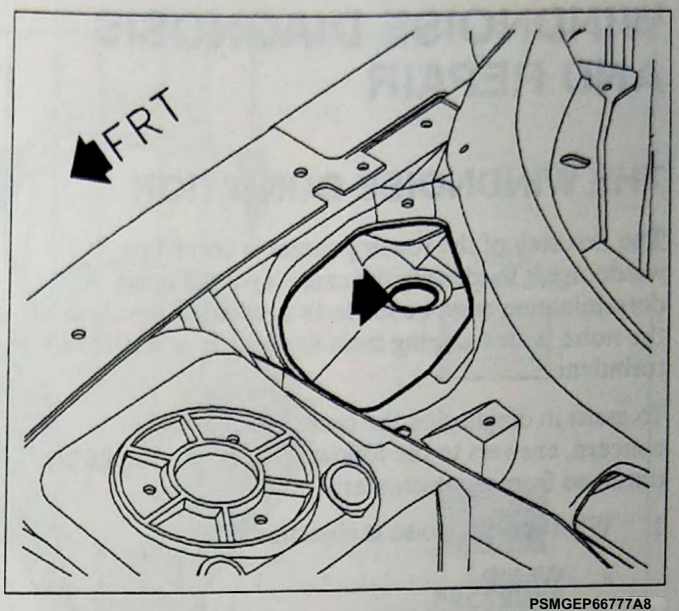
PLENUM DRAINAGE

Plenum drainage is accomplished through the IK, NF - - dram holes m *the* lower corners of the plenum panel If the cowl is not draining properly chert P<met it drain holes arc not blocked or plugged Removal and clean drain holes as necessary". ° C biockage



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WINDNOISE DIAGNOSIS AND REPAIR

THE WINDNOISE CONDITION

The first step of the repair process in correcting windnoise is to identify the cause(s) of the noise. A determination must be made as to whether the cause of the noise is air escaping from the vehicle or outside air turbulence.

To assist in diagnosing the cause of a windnoise concern, answers to the following questions should be obtained from the customer:

1. What specific noise is objectionable?
   a. Whistle
   b. Flutter
   c. Rush of air
2. At what speed does the noise occur?
3. Does the noise appear to be:
   a. Air leaving the body? (internal windnoise)
   b. Air passing over the body's exterior surface? (external windnoise)
4. In what general area does the noise appear to originate?
   a. Front of the vehicle
   b. Side of the vehicle
5. Is the heater/AC blower motor On or Off?

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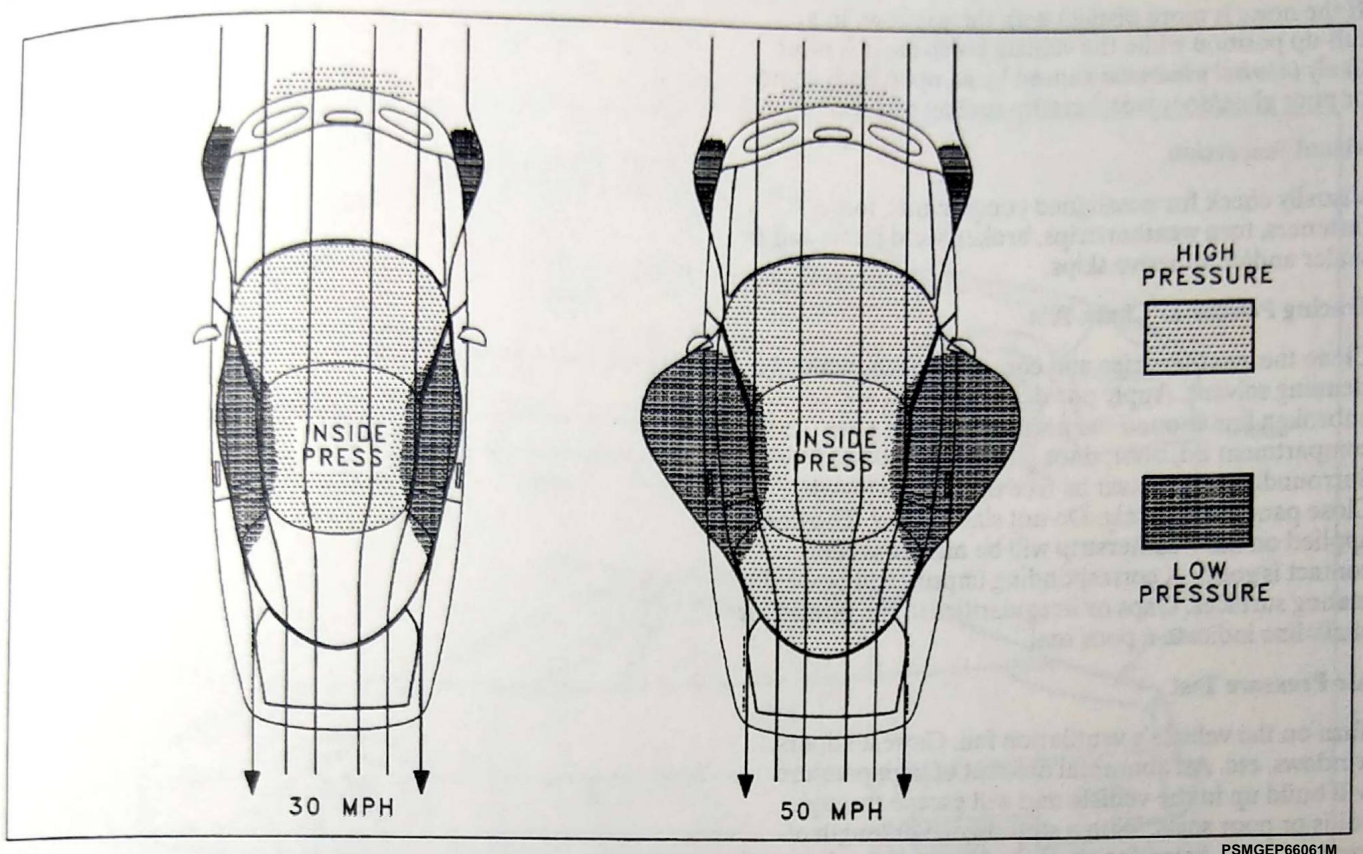

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ANALYZING WINDNOISE

When analyzing windnoise, it is important to understand the forces that act upon the vehicle that can create this condition. As air strikes and bends around the front of a vehicle in motion, it causes a low-pressure area to develop around the front pillars and side window locations of the body. At the same time air flow' that is filtered through the vehicle's vents and will cause a high-pressure to build-up inside the passenger compartment. The faster the vehicle is traveling, the greater the pressure difference between the inside and outside of the vehicle becomes.

The high inside pressure and low outside pressure is separated only by the vehicle's exterior panels, glass, weatherstrips, and body seals. When an opening is created at a body seam or weak weatherstrip contact area, the high inside pressure will move towards the low outside pressure and create an internal windnoise.

Wind rush or external windnoise is created by the air passing over and around misaligned body components such as mirrors and door moldings.

THE ROAD TEST

S^TION: F0R SAFETY REASONS AN ASSISTANT SHOULD DRIVE THE VEHICLE **."HILE THE TECHNICIAN CHECKS FOR THE ^CATION OF THE REPORTED CONDITION(S).**

To analyze a reported windnoise condition, a test drive in the vehicle is necessary due to the many conditions that could cause the objectionable noise and determine if the windnoise condition is external, internal or a combination of the two.

NOTICE: Often there is one primary leak source and one or more secondary leaks that contribute to the noise condition. Repairing only one of these sources may not completely repair the total condition, but only reduce it.

The following items should be used by the technician during the test drive to aid in locating the leak area:

1. Mechanic's stethoscope or vacuum hose
2. Masking tape-50 mm (2 in. in width)
3. 3M® Strip-Calk - P/N 08578 or equivalent.
4. China marking pencil.

The vehicle should be driven at the speed in which the noise was noticed by the customer or until it is heard.

NOTICE: Safe legal speeds should never be exceeded.

If the noise can be heard with the door glass lowered and the vehicle driven, it is most likely *external windnoise.*

Locating an external windnoise is accomplished by taping off various moldings and gaps until the noise is eliminated to pinpoint the exact cause of the noise.

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If the noise is more distinct with the windows in a full-up position while the vehicle is driven, it is most likely *internal windnoise* caused by an open body seam or poor glass/door weatherstrip sealing surface.

Visual Inspection

Visually check for misaligned components, loose fasteners, torn weatherstrips, broken weld joints and/or sealer and/or adhesive skips.

Tracing Powder or Chalk Test

Clean the weatherstrips and contact surfaces with cleaning solvent. Apply powder or chalk in an unbroken line around the perimeter of the rear compartment lid, door, door glass or hood. Surrounding areas must be free of chalk or powder. Close panel completely. Do not slam closed. The line applied on the weatherstrip will be marred where contact is good. A corresponding imprint will be on the mating surfaces. Gaps or irregularities in the powder or chalk line indicate a poor seal.

Air Pressure Test

Turn on the vehicle's ventilation fan. Close all doors, windows, etc. An abnormal amount of high pressure will build up in the vehicle and will escape through voids or poor seals. With a stethoscope or length of vacuum hose, listen for escaping air along the door and window seals.

SQUEAK AND RATTLE DIAGNOSIS

Basically, squeaks and rattles are caused by improperly controlled relative motion between components. There are three means to prevent the squeak and rattle:

1. Attach component securely so there is no relative motion during operation.
2. Separate components so there is no contact under operating conditions.
3. Insulate components so that no squeaks and rattles occur within relative motion between components. Low uniform friction surfaces can be provided to eliminate "stick-slip" motion.

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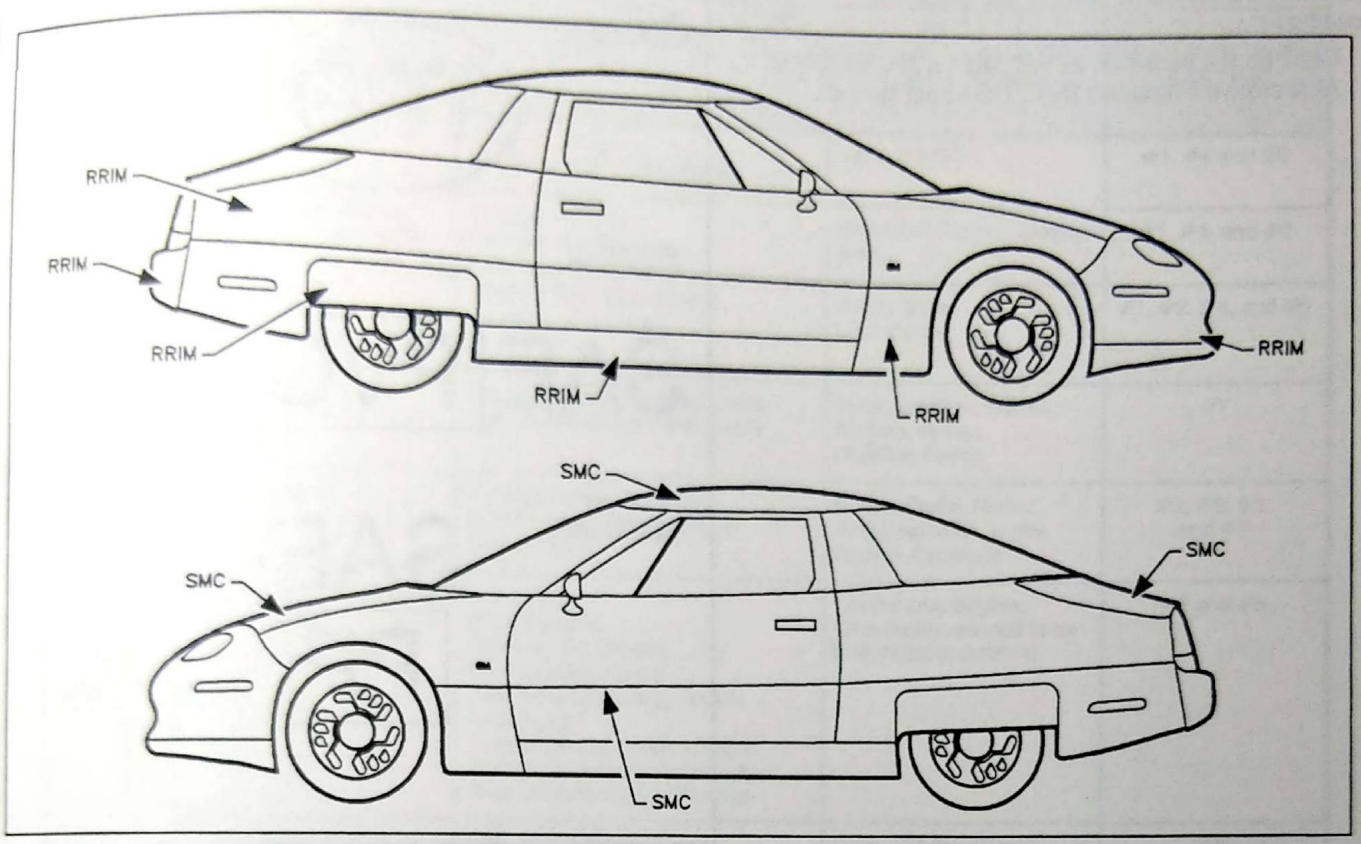
BODY REPAIR



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EXTERIOR PANEL MATERIAL IDENTIFICATION

Exterior body panels are constructed of two different materials. This is due to increased dent and corrosion resistance of modem composites. The fenders, quarter and rocker panels are made from RRIM. Front and rear fascias (bumper covers) are also made from RRIM. The hood, roof panel, doors, and rear compartment lid are made of SMC materials.

Different materials require different procedures for repair and refinishing. Before starting any repair, identify the type of material involved and follow the correct procedure.

For ease of understanding the repair processes they will be addressed according to the level of damage. The following chart outlines the level of damage and repair process for exterior plastic panels.

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PLASTIC PART IDENTIFICATION

To identify plastic parts, observe the following procedures:

1. Look on the back side of the part for the Society of Automotive Engineers (SAE) marking symbol.

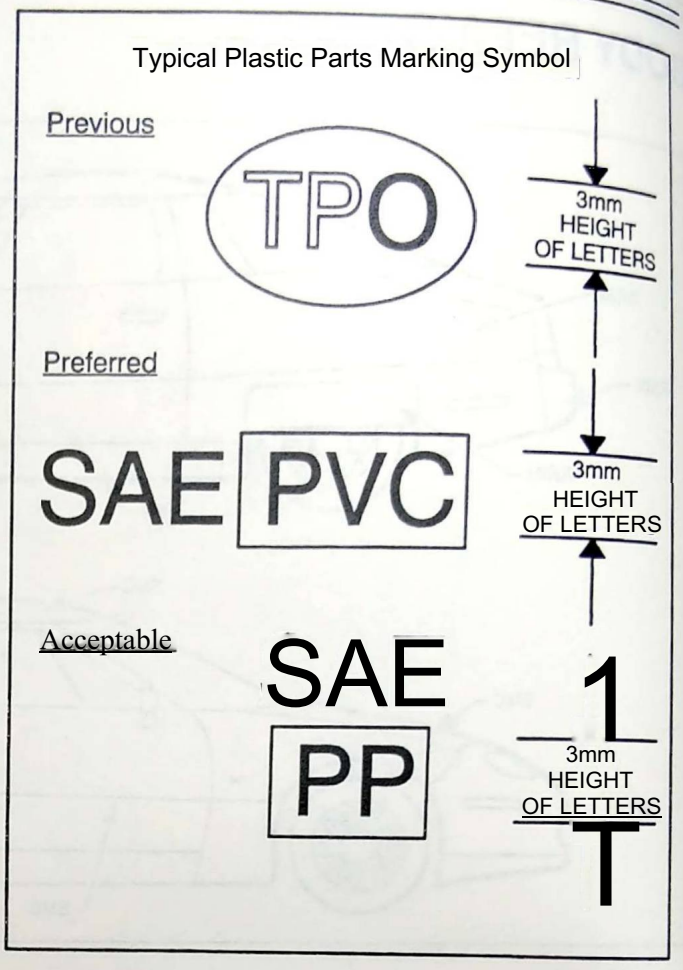

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CHART OF PLASTIC PARTS IDENTIFICATION AND REFINISHING SYSTEMS

IDENTIFYING SYMBOL	CHEMICAL COMPOSITION OR PLASTIC *FAMILY* NAME	TYPICAL AREA(S) WHERE PART USED	EXAMPLES OF COMMON AND/OR TRADE NAMES	TYPICAL PAINT REPAIR SYSTEM
^ASA	Acrylonitrile Styrene Acrylate	Door Appliques Quarter Outer Upper Panels	Luran S 778T	#1, #4 and #6
ABS + PC	Acrylonitrite/Butadine - Styren + Polycarbonate	Charge Port Door Charge Port Bezel	Baybland, Proloy, Cycoloy, KHA	#1, #4, and #6
~"pC + PBTP	Polycarbonate + Polybutylene Terephthalate	Outside Rear View Mirrors (housing and cover)	Xenoy, Valox Macroblend	#1, #2, #4, and #5
PE	Polyethylene	Front Wheelhouse Panel Liners Rear Wheelhouse Panel Liners	Dylan, Fortiflex, Marlex, Alathon, Hi-Fax, Hosalen, Paxon	#7
PP	Polypropylene	Air Inlet Screen Assembly Engine Compartment Front Sight Shield	Profax, Oleflo, Marlex, Azdel, Novolen, Tenite, Daplen, Escorene	#2, #3, #5, and #7
PUR	Polyurethane, Thermoset (Unsaturated)	Front Facia Front Fenders Outer Rocker Panels Rear Quarter Panels Rear Wheel Opening Covers Rear Facia Front Underbody AirDeflector Center Underbody AirDeflector Rear Underbody Air Deflector	Castethane, Bayflex, (Commonly referred to as RIM, RRIM and SRIM)	#2 and #5
PVC	Polyvinyl Chloride (Vinyl)	Exterior Moldings	Geon, Vinylite, Pliovic, "Vinyl", Vinoflex, Unichem	#8
UP	Polyester/Thermoset	Front End Panel Hood Assembly Roof Outer Panel Roof Side Rails Doors Rear Compartment Lid Assembly Rear Window Drain Panel	SMC, Premi-Glas, Selectron, Vibrinmat, "Fiberg las"	#1, and #4

NOTE: Follow selected paint manufacturer's product label directions. Observe all warnings on material container labels.

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TPO = Typical marking symbol used to identify the chemical composition of each plastic part.

SUGGESTED PLASTIC PARTS PAINT REPAIR SYSTEMS

SYSTEM #1 (Exterior)
Conventional Acrylic Urethane

SYSTEM #2 (Exterior)
*Flexible/Acrylic Urethane

SYSTEM #3 (Exterior)
Polypropylene Primer and Special Topcoat

SYSTEM #4 (Exterior)
Base Color Coat with Acrylic Urethane Clear Coat

SYSTEM #5 (Exterior)
Base Color Coat with Flexible Urethane Clear Coat

SYSTEM #6 (Interior)
Conventional (Standard) Interior Acrylic Lacquer

SYSTEM #7 (Interior)
Polypropylene Primer and Standard Interior Topcoat

SYSTEM #8 (Interior)
Vinyl Interior Color

* Contains Isocyanates — Use recommended respiratory protection

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BODY PAINT

PAINT CONDITIONS AND REPAIR

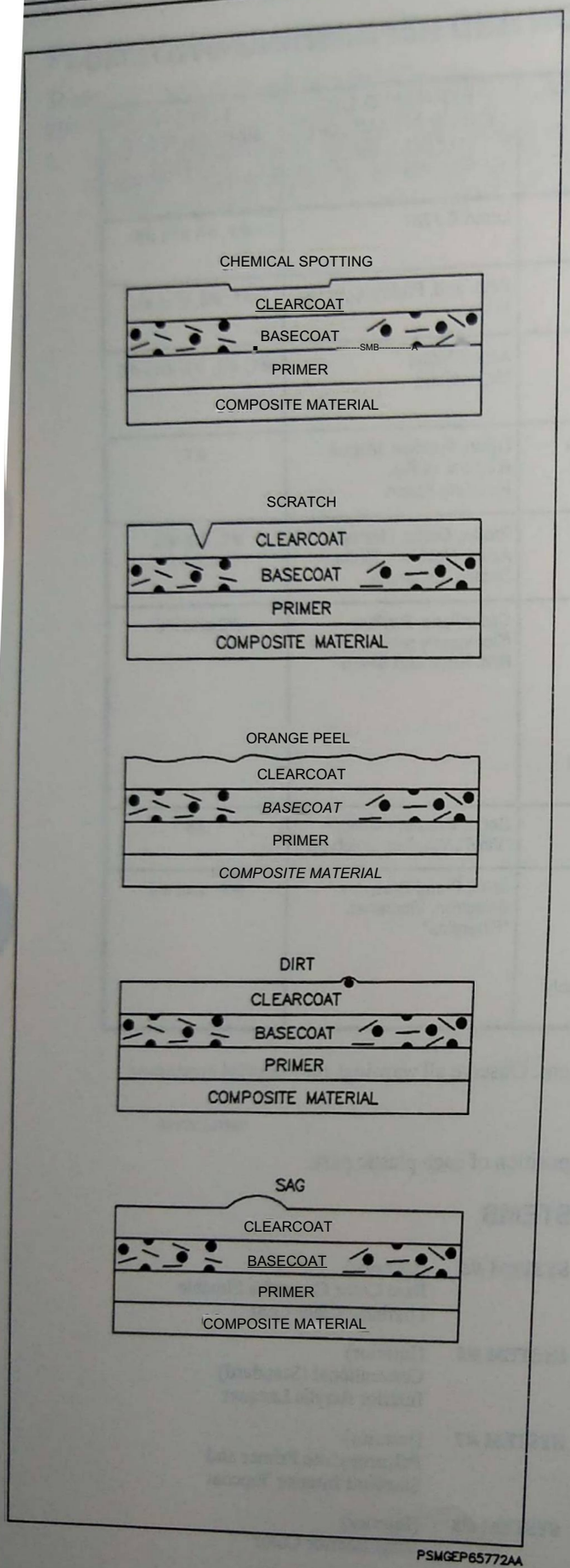
EVl automobiles are finished with a basecoat/clearcoat paint system. This process consists of a spray-on primer on all composite panels, and a high solid solvent borne basecoat and catalyzed urethane clearcoat.

CLEARCOAT REPAIR WITHOUT REFINISHING

Urethane clearcoats provide a degree of protection for the finish that many single stage paint systems do not. As a result it may be possible to correct a number of minor paint defects without refinishing the affected panel. Examples of the types of defects which can be repaired in this manner are shown in the illustration.

It must be noted however that in cases where a significant amount of clearcoat has been removed it may be worthwhile to spray an additional coat to ensure long-term durability of the finish. In either case little time is wasted in the process since it is a good practice to clean the repair area with compound prior to a spot repair.

1. Thoroughly wash repair area with a mild detergent and water solution.
2. Apply a small amount of fine machine rubbing compound to repair area and spread evenly with compounding pad.
3. With polisher running at approximately 1700 rpm, compound repair area. Keep pad flat against panel while applying light pressure. Feature lines and panel edges should be hand-rubbed to avoid bum-through. Check repair area frequently and, if necessary, add more compound.
4. If sanding is required, proceed to step 6. If no sanding is required, apply polish to repair area and evenly spread with polishing pad.
5. Keep pad flat to panel and allow weight of polisher to do the work. Use polish sparingly to achieve original shine. Machine or hand polish repair area first, then blend in with rest of panel.



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***NOTICE;* If repair is near adjacent panels mask adjacent panel to protect against sand scratches anH burn-through of panel edges.** na

6. Attach a piece of micro-fine sandpaper to a sanding pad. The addition of a small amOunt of liquid detergent to the water will imprOVe Wet out and sanding performance.

7. Keep repair area wet while sanding. Sand lightly and evenly in one direction only, using straight strokes. 61

IMPORTANT: Frequently wipe or squeegee repair to determine when defect has been removed. Sand only enough clearcoat to remove defect. Sanding through clearcoat requires the panel to be colorcoated and clearcoated.

8. Using a clean cloth, wipe repair area clean of water and clearcoat residue.

9. Compound and polish as necessary. Often, hand compounding and polishing of a small repair area is all that is necessary to restore appearance.

SPOT REPAIR AND BLENDING

Basecoat/clearcoat finishes offer opportunities to readily blend and match colors. Blending is achieved in the basecoat stage. Providing the repair does not extend to the edge of the panel, blending of adjacent panels is not required to achieve a match. All clearcoating can be accomplished on a panel by panel basis depending on the repair.

BASECOAT/CLEARCOAT REFINISHING

CAUTION: MANY PAINT REPAIR SYSTEMS REQUIRE ADDITIVES CONTAINING ISOCYANATES. IT IS ESSENTIAL THAT ALL RECOMMENDATIONS AND WARNINGS LISTED ON THE CONTAINER LABEL FOR MATERIALS SELECTED BE FOLLOWED. IT IS MANDATORY THAT ADEQUATE RESPIRATORY PROTECTION BE WORN. EXAMPLES OF SUCH PROTECTION ARE: AIRLINE RESPIRATORS WITH A FULL HOOD OR HALF MASK, OR DISPOSABLE RESPIRATORS SUCH AS 3M® MODELS #6984 AND #6986. SUCH PROTECTION SHOULD BE WORN DURING THE ENTIRE PAINTING PROCESS. PERSONS WITH RESPIRATORY PROBLEMS OR THOSE ALLERGIC TO ISOCYANATES MUST NOT BE EXPOSED TO ISOCYANATE VAPORS OR SPRAY MIST.

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COLLISION REPAIR INFORMATION

This type of body construction requires that unifram components be aligned properly to assure correct suspension location and dimensioning of underbody and upperbody components. Since each individual unibodv component contributes directly to the structural integritv of the body, it is essential that proper welding, sealing and rustproofing techniques be observed when performing service and body operations.

The EVl is a spaceframe vehicle. The vehicle structure is constructed of aluminum. The joining of structural components is done by bonding, welding, and riveting components together. There are three types of aluminum used. There are stampings made of sheet aluminum, castings of aluminum, and extrusions of aluminum. The sheet HO stamping is referred to as a 5754 aluminum alloy. The casting is referred to as A356-T6 aluminum. The extrusions are referred to as 6063-T6 and C210-T6 aluminum. For more information on the locations of these materials see the structural sections of this service manual.

The aluminum is chemically pre-treated to enhance the bondability of the factory applied adhesive material. The pre-treatment process produces a thin coating layer of chromium on the surface, which serves to stabilize and protect the surface for consistent wetting and bonding of the factory applied adhesive.

NOTICE: The chemically pretreated aluminum is important for the bondability of the factory applied adhesive. The SIP pre-treatment will be substituted for the factory applied aluminum pre-treatment. (For more information on SIP see "SIP" in the Collision Repair Information section of this service manual.)

One of the first steps in repairing damage to an EVi's uniframe construction is to determine the extent of the damage to the vehicle's structure. Body dimension charts are provided to assist you in identifying and repairing the damaged areas. For more information on how to repair an electric vehicle refer to the "Body/Collision Service Manual."

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HEATING AND STRAIGHTENING ALUMINUM

NOTICE: Care must be taken not to damage any adhesive between joints in areas of the structure that will be replaced. Remember that the aluminum can carry the heat a considerable distance from the area you are heating. Use heat damming material and orlet S to control the heat to only the area that you intend to heat.

The sheet stamping parts can be heated to 300°F (148’C). The use of a heat crayon is most useful in this application. Aluminum doesn’t change color when heated. To ensure heat limit is not exceeded heat damming material usage is necessary around areas of adhesive. To minimize potential of heat damage to bonded joint. When heating a panel, every effort must be made to avoid destroying the adhesive bond between he panels. Some type of heat monitoring is necessary for monitoring temperatures. Use either a heat crayon or heat paint.

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NOTES

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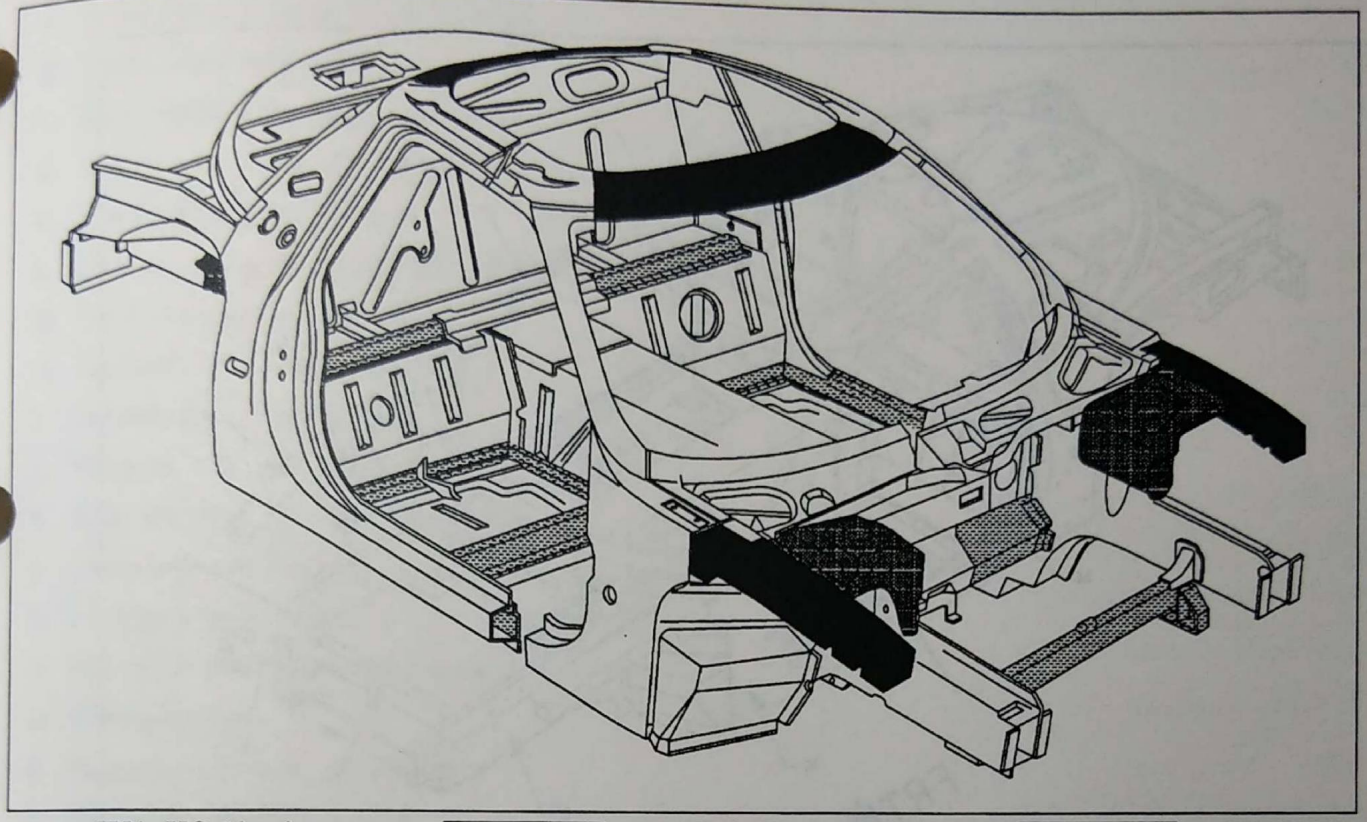
STRUCTURAL



- 5754–HO Aluminum =
- C210–T6 Aluminum =
- A356–T6 Aluminum =
- 6063–T6 Aluminum =

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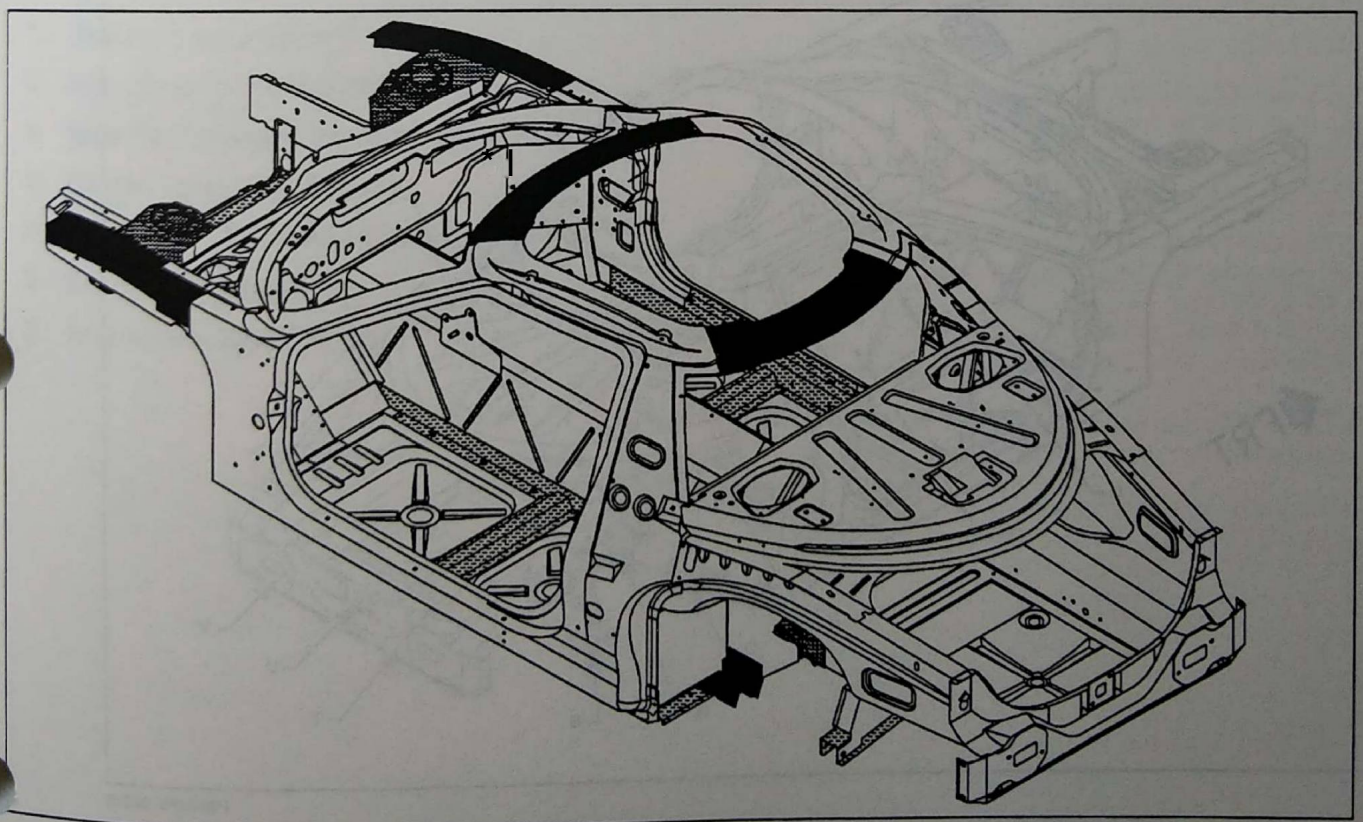

- 5754-HO Aluminum =
- C210—T6 Aluminum =
- A356-T6 Aluminum =
- 6063-T6 Aluminum =

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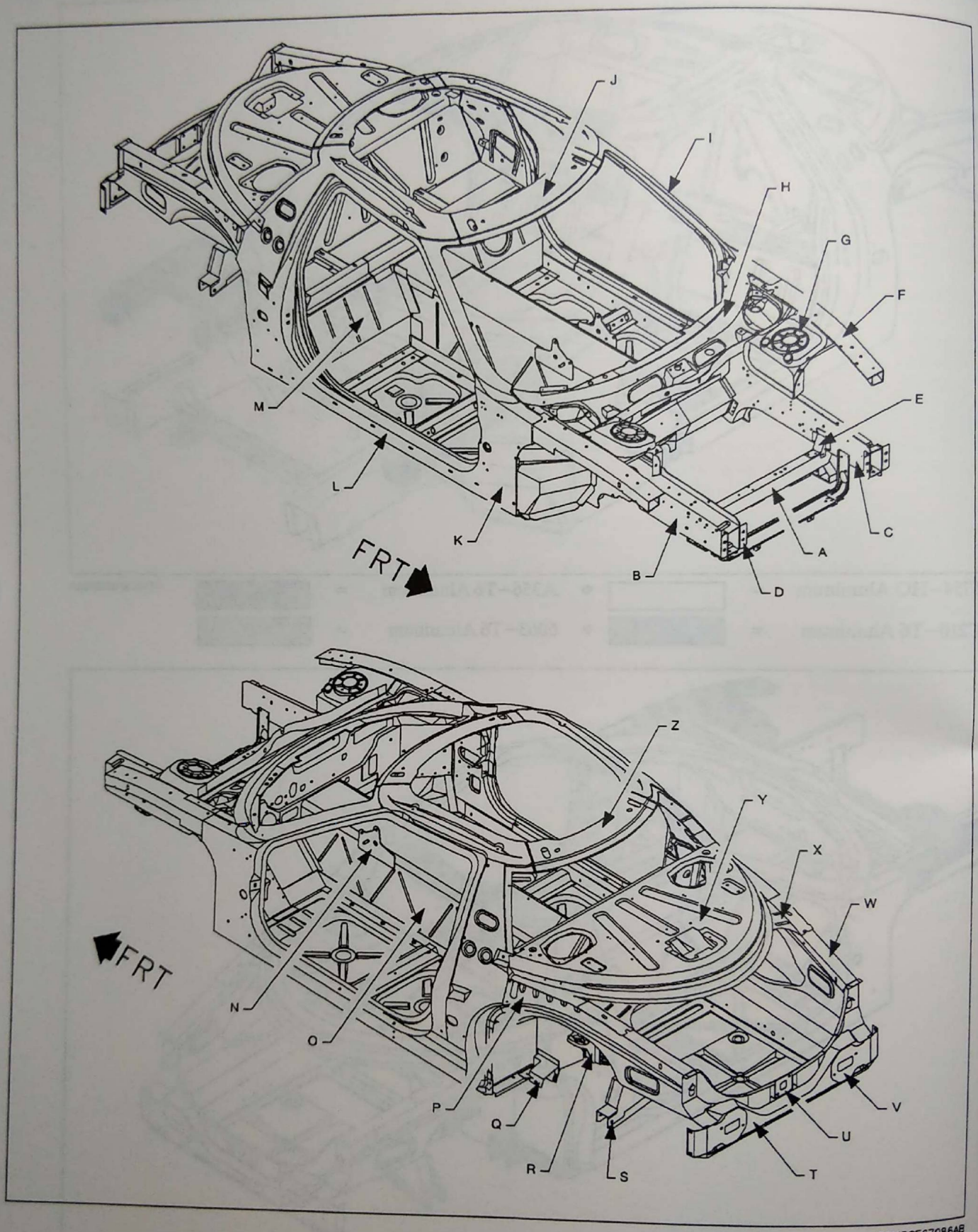

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NOMENCLATURE **FOR STRUCTURAL PANELS**

A. Front end lower center tic bar assembly

p Front compartment side rail assembly

C Front compartment side rail assembly

p Front bumper impact bar bracket

F Front end lower tie bar brace

F Front compartment upper side rail assembly

G. Front shock tower assembly

H. Windshield outer lower frame

I. Windshield side inner frame

j. Windshield upper frame

K. Body side hinge pillar area frame

L. Body side frame/Door ring

M. Floor panel rear cross bar

N. Instrument panel knee bolster bracket

O. Floor panel center tunnel

P. Quarter upper outer side rail

Q. Rear axle control arm bracket

R. Rear shock absorber housing

S. Rear axle tie rod bracket, and front and rear reinforcements

T. Rear end panel assembly

U. Rear end panel lid lock striker reinforcement

V. Rear bumper impact bar reinforcement

W. Quarter upper inner side rail

X. Rear window inner lower frame extension

Y. Rear window panel

Z. Rear window upper frame

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CORROSION REPAIRS

TYPES OF CORROSION

All metals are subject to some sort of corrosion. The corrosive action may cover the surface of the metal or it may corrode in deep pits. It is possible to have corrosion follow the metals grain boundaries on the surface of the metal or it may corrode to form deep pits. Corrosion may follow the metals grain boundaries either on the surface or penetrate in the surface. The corrosion may be caused by the metals being in direct contact with other materials.

The two most common corrosions seen on the Electric Vehicle are:

• Galvanic corrosion

• Electrolysis

Corrosion is referred to as the following types:

- Direct surface attack
- Dissimilar metals corrosion (galvanic corrosion)
- Pitting

• Stress corrosion

- Corrosion fatigue
- Fretting
- Electrolysis

CAUTION: BEFORE PERFORMING APPLICATIONS FOR CORROSION REPAIR, REFER TO "SAFETY AND HEALTH" IN THIS MANUAL.

Before repairing corrosion, you must first identify the type(s) of corrosion that is causing a problem. Because there are different types of corrosion, specific repair procedures may need to be applied to fix that type of corrosion.

IMPORTANT: Recognizing what causes corrosion will help prevent corrosion reoccurrence.

After corrosion clean up is complete, inspect the surface for holes or cracks. If welding is needed to fix damaged area refer to "Welding" section of this manual.

CORROSION FATIGUE

Corrosion may start at the bottom of a shallow pit in stressed area. The corrosion happens when continuous flexing destroys the protective surface coatings, such as chromium, paint, undercoating or natural oxidized film, and additional corrosion takes place in the area of the stress.

DIRECT SURFACE ATTACK

The most common type of corrosion is caused by direct reaction of aluminum surfaces with oxygen in the air.

DISSIMILAR METALS CORROSION

When two dissimilar metals come in contact with each other and are connected by an electrolyte (continuous liquid or gas path - salt spray, exhaust gas or condensation), accelerated corrosion of one or both of the metals may occur.

ELECTROLYSIS

Electrolysis is formed when the electrical current attachment point causes a build up of corrosion or causes it to corrode at an accelerated rate.

FRETTING

Fretting occurs when close fitting and movable parts begin to rub against each other. The rubbing contact destroys any protective film that may be present on the metallic surface. This action also removes small particles of virgin metal from the surface or deeper into the metal.

PITTING

A localized breakdown of the surface protection, such as chromium, can be due to a lack of homogeneity in the alloy surface. The cause can be from mechanical working or faulty heat treatment.

STRESS CORROSION

Results from the combined effect of stresses applied to a surface while under corrosive conditions. Cracking susceptibility increases with stress, mostly at stresses approaching the materials yield point.

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SAFETY AND HEALTH

rAl TION: ALWAYS WEAR SAFETY GLASSES AND RESPIRATORY EQUIPMENT WORKING ON OR AROUND ALUMINUM.

The light weight of aluminum requires specific considerations related to safety and health during filing and disc sanding operations. Adequate eye protection " Is important. .Aluminum particles, if embedded in the eve. do not respond to withdrawal by electromagnetic equipment (often used to remove steel under similar circumstances). Probing with a surgical instrument is the alternative.

Respirator)' protection is another consideration when working with aluminum. Aluminum dust created during disc sanding, as well as filings produced during filing or grinding operations, tend to float in the air temporarily. For protection against floating aluminum dust and filings, a particle mask should be worn by the operator and others close by.

CORROSION REMOVAL

When corrosion is detected, remove it as quickly as possible and protect the surface from further corrosion. In those cases where the corrosion has progressed extensively, the strength of the part may be in jeopardy and the part may need to be replaced.

Treatment includes the mechanical removal of as much of the corrosion products as practical and the inhibition of residual material using PPGs DX 533 or equivalent of an aluminum preparation/cleaning chemical, followed by the restoration of permanent surface coatings. Do not use steel wool, emery cloth, steel (except stainless steel) wire brushes, or severe abrasive materials because particles of the steel wool or emery cloth will become embedded in the soft material and cause corrosion.

COATINGS

When aluminum surfaces are exposed to the atmosphere, a thin invisible oxide skin forms immediately which protects the metal from further oxidation. This self-protecting characteristic gives aluminum its high resistance to corrosion. This corrosion does not allow proper adhering of the adhesive to panels after a repair. The surfaces must be clean and free of oxidation when using an adhesive as well as when welding.

When corrosion is repaired it will be necessary to recoat the repaired area. Recoating a repaired area will help prevent corrosion reoccurrence in susceptible areas, due to reasons mentioned in the corrosion repair section in this manual.

On all areas that will be bonded, careful preparations must be made. Refer to the “Collision Repair, Aluminum, and SIP.” sections in this service manual for directions on how to prepare the surfaces of the flanges to be bonded together. For more information on how to replace and repair components, refer to the “Body Collision Service Manual.”

NOTICE: Once the corrosion is completely removed apply a protective coating as soon as possible. If the repaired area is left unprotected for more than an hour, repeat step (4) before going to steps (5-8).

1. Clean the entire area to be repaired with a wax, and grease remover following the manufacturers recommendations.
2. Remove corrosion by practical mechanical means.
3. Feather out any coatings in the surrounding areas of the repair and wipe clean.
4. Use PPG chemfil aluminum cleaner DX533 or equivalent on areas to be refinished following manufacturer’s recommendations.
5. Apply self-etch type primer to repair area and let primer dry.
6. Apply epoxy prime to repair area and let dry.
7. Sand primer using 220-320 grade sandpaper.
8. Apply color coat.

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INDUSTRIAL FALLOUT (ACID RAIN)

IMPORTANT: The following information regards the use of finesse-type repairs to in u- d strial fallout (acid rain) and rail dust damage of basecoat/clearcoai p t paint finishes.

Since the severity of the condition varies from area to area, proper diagnosis of the damage extent is critical to the success of repairs. Diagnosis should be performed under high-intensity fluorescent lighting, on horizontal surfaces (hood assembly, roof panel assembly, rear compartment lid assembly) after they have been properly cleaned.

There are three basic types of acid rain damage:

Surface level contamination — may be repaired by simply washing the vehicle, cleaning the surface with silicone, wax and grease removal, neutralizing acidic residue and finesse polishing.

Clearcoat etching - slight etching still noticeable after the above washing and finesses polishing procedure.

Basecoat etching - severe etching beyond the clearcoat at the basecoat.

SURFACE LEVEL CONTAMINATION REPAIR

1. Wash vehicle with standard car wash detergent and water, and dry thoroughly.
2. Clean affected area with a silicone, wax and grease remover.
3. Neutralize leftover acidic residue by cleaning damaged areas with mixture of baking soda and water (one tablespoon per quart of water), rinse thoroughly and dry panel assemblies completely.
4. Apply finesses-type polish with foam pad.
   - If damage has been repaired, remove any swirl marks with dual-action orbital polisher and foam pad.
   - If some damage remains, proceed to "Slight Clearcoat Damage -Wet Sanding, Finesse Polishing" in following procedure.

SLIGHT CLEARCOAT DAMAGE - WET SANDING, FINESSE POLISHING

1. Select small test area on damaged panel assembly.
2. Wet sand damaged area with an American grade ultra-fine sandpaper of 1,500 to 2,00 grade Ld
   a. Use ample amount of water
   b. Go slow to prevent removing too clearcoat.

IMPORTANT: Be sure to use American sa nd Paper European sandpaper has a P before the grit and European grits do not align with Ameri nUniber the majority of the time. an grits

3. Remove excess water with rubber squeee gCe an d inspect area.

   If wet sanding has removed the damage, co the sanding procedure on the entire panel assembly. Apply a finesse-type polish with a f pad and remove any swirl marks with a dual- orbital polisher and foam pad.

4. Polish entire vehicle after all damaged has been repaired.

CLEARCOAT THICKNESS

The clearcoat on the vehicle is typically 0.059 to 0.078 mm (1.5 to 2 mils; 0.00015 to 0.00020 in.) thick.

PAINT GAUGES

The best way to accurately measure how much clearcoat has been removed is to use a paint gauge before, during, and after the sanding process. Paint gauges measure the total thickness of the finish and when used, can determine how much clearcoat has been removed during the repair process. Paint gauges range from magnetic pull types to sophisticated electronic types and are available from a variety of sources.

The older magnetic type gauges, at best have a +/- percent accuracy range and are not sensitive enough to detect removal of 0.020 mm (0.5 mil; 0.0005 in.) clearcoat. The newer type magnetic gauges have improved accuracy ranges. Most gauges are confine checking either ferrous metal or non-ferrous meta (aluminum) panel assemblies.

The more sophisticated digital type gauges are able t read film thickness of both ferrous and non-ferrou metal panel assemblies. Digital gauges can k^ve a accuracy range of +/— 1 percent and include t i standards for recalibration.

RAIL DUST DAMAGE REPAIR

CAUTION: RAIL DUST REMOVER (OJJJMNG ACID) IS AN ACIDIC SUBSTANCE CONIAJ, CHEMICALS THAT WILL BREAKDOWN*^ IRON PARTICLES EMBEDDED IN THE * WHEN WORKING WITH IT, USE THENEC SAFETY EQUIPMENT, INCLUDING GL^ GOGGLES. FOLLOW THE MANUFAC1E DIRECTIONS CLOSELY BECAUSE IT ^„ REQUIRE SPECIAL HANDLING AND D

Rail dust damage comes from the tiny iron particles produced from the friction between the train wheels and the track. It can also be deposited on vehicles if stored near any operation producing iron dust (e.g., steel ore yards). This dust can either lay on top of, or embed into the paint surface. It is usually diagnosed as bumps in the paint surface or rust colored spots in the paint.

]. Wash vehicle with car wash soap and water, dry it and clean affected area with a silicone wax and grease remover.

2. Rinse surface with cold water, keeping vehicle in cool or shaded area.

3. Soak several terry cloth towels in container of rail dust remover solution. After damaged areas have been rinsed with cold water, lay wet towels on damaged areas.

IMPORTANT: Keep towels moist by spraying with water. Do not allow towels to dry on surface of vehicle.

4. .Allow towels to remain in place for 20 minutes.

5. After 20 minutes of applying towels, remove them and rinse area thoroughly with cold water. Inspect affected area to ensure dust has been removed. Use both touch (feeling for bumpy surface) and sight (magnifying glass for close inspection).

6. If, upon inspection, some particles are still present, repeat applying towels process up to three times.

7. Select test area and hand wet sand with American ultra fine 1,500 grade to 2,000 grade sandpaper to repair damage (surface pitting from dust). Use ample amounts of water and go slow to prevent removing too much clearcoat.

IMPORTANT: Use a paint gauge to determine the amount of clearcoat removed. If too much has been removed, additional clearcoat will have to be applied.

If rail dust has penetrated into the basecoat, the panel assembly requires refinishing. Make sure all rail dust has been removed prior to refinishing or rust spots will return, causing customer dissatisfaction.

8- If damage has been repaired, complete repair to entire panel assembly.

9. Polish the entire vehicle after all damage has been repaired.

PREVENT INDUSTRIAL FALLOUT

To prevent industrial fallout (acid rain) damage, customers should be urged to wash and dry their vehicle frequently and garage them, or at least cover them with a quality car cover when not in use.

Vehicles in dealer inventories should be kept clean and dry- A vehicle that sits unattended, especially after the sun has dried any water on the body surface, is a target for acid rain damage.

UNDERCOATING - PRIMING/SURFACING

RRIM AND SMC RIGID PLASTIC

Upon the receipt of the primed replacement parts, it will be necessary to inspect for surface imperfections that may result from dirt in the primer or damage to the part from shipping. If at anytime during this inspection defects are found that will require repair, special care must be given to the part to endure that the substrate is not exposed. If the substrate is exposed as the result of sanding or scratches incurred during shipment, application of an aggressive paint system may allow solvent migration into the substrate which will lead to a swelling of the leading edge of the damaged coating. To safe guard against this, the following procedure was developed to provide a less aggressive barrier coat between the substrate and the refinish system.

DISCLAIMER: Saturn Corporation believes the following materials to be reliable. There may be additional manufacturers of such materials. Saturn Corporation does not endorse, indicate any preference for, or assume responsibility for the following materials from these firms or for any such materials which may be available from other sources.

1. Wash the damaged panel and surrounding areas with water and a mild detergent, rinse thoroughly and let dry.

2. Clean the panel with PPG DX 330 Acrylic-Clean or equivalent.

3. Repair all damaged areas. Refer to appropriate repair section for procedure.

4. Sand the entire panel with 240 grade sandpaper.

5. Clean all sanded areas with PPG DX 103 Multi-Prep Cleaner or equivalent to remove sanding residue.

6. Use an air blow gun to remove all dirt from the cracks and surfaces of the vehicle.

7. Apply one coat of DP Epoxy Primer or equivalent primer over all bare panel areas. Use 276 - 345 kPa (40 - 50 psi) of air pressure at the gun.

8. Allow 30 minutes dry time before applying primer surfacer.

9. Apply two or three medium coats of K.-36 Acrylic Urethane Primer Surfaces or equivalent to component primer surfacer.

10. Apply a light guide coat over the primer. Over reduced (150% to 200%) conventional primer surfacers will work well as a guide coat.

11. Allow the two component primer to dry for 1 1/4 hours, under normal conditions, before sanding. Wet sand with 400 grade (or finer) sandpaper or dry sand with 320 grade (or finer) sandpaper. Use the guide coat as an indicator to locate imperfections which need to be sanded out.

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REPLACEMENT PARTS REFINISHING

ALUMINUM

Any steps needed to color coat the aluminum structure will require priming and painting similar to steel.

IMPORTANT; These steps can also be used for any required refinishing after welding operations have been completed.

1. Clean the area to be repainted with a wax and grease remover following the manufacturer's recommendations.
2. Abrade surface of new service part with sandpaper, stainless steel wire brush, or other practical means. Do not use steel wool, emery cloth, or steel brush. For refinishing after welding, clean weld area with PPG's DX533 or Equivalent and sand as necessary by practical means. Do not use steel wool emery cloth steel brush (unless stainless steel brush) For more information refer to "Corrosion Removal" in this Service Manual.
3. Clean part using PPG's chemfil aluminum cleaner DX533 or equivalent on the part or areas of damage that require refinishing.
4. Self-etch primer the area.
5. Epoxy prime the area.
6. Sand primer using 220-320 grade sandpaper.
7. If necessary, apply color to part.

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BASECOAT/CLEARCOAT SPOT REPAIR

DISCLAIMER: Saturn Corporation believes the following materials to be reliable. There may be additional manufacturers of such materials Saturn Corporation does not endorse, indicate anv preference for. or assume responsibility for the following materials from these firms or for any such materials which mLhe available from other sources.

i Wash the entire panel and surrounding areas with ' water and a mild detergent soap, rinse thoroughly and wipe dry'.

-> Clean the entire panel with PPG DX330 Acryli-Clean or equivalent.

Prepare all damaged and bare panel areas. (Refer to appropriate section on repair or undercoating.)

4 Sand the repair area. Wet sand with 400 grade (or finer) sand paper or dry sand with 320 grade (or finer) sandpaper.

5 Thoroughly sand the entire panel area with 1200 grade (or finer) sandpaper.

6 Clean the entire panel with PPG DX103 Multi-Prep Cleaner to remove the sanding residue.

7. Use an air blow gun to remove all dirt from the cracks and surfaces of the panel.

8. Tack entire panel with a clean tack rag.

9. Mix basecoat color. Refer to product label instructions.

10. Apply the first coat of basecoat color over the repaired area only. Use 207-276 kPa (30 - 40 psi) of air pressure at the gun. Allow five to ten minutes flash time between each coat of basecoat color.

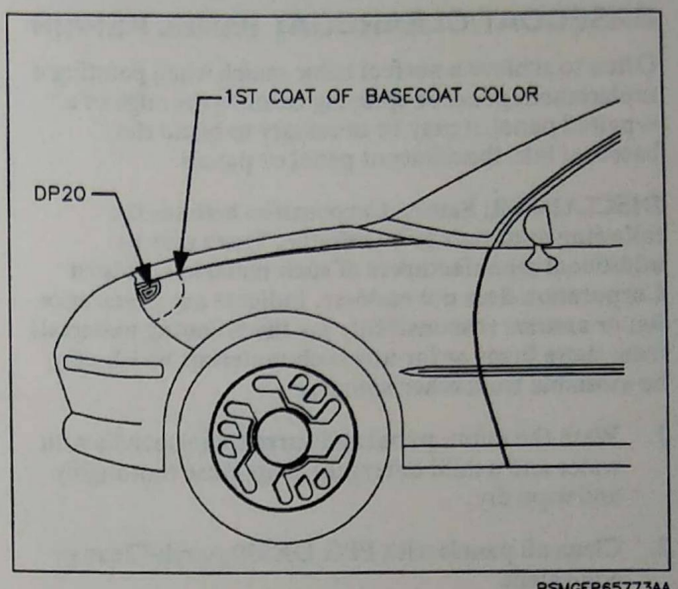
11. Apply the second coat of basecoat color over the same area as the first and about 100-150 mm (4-6 in.) beyond where the first coat ended.

12. Apply the third coat, (if needed), over the same area as the second coat and about 100-150 mm (4-6 in.) beyond where the second coat ended. . Normally two or three coats are required to o tain hiding. Do not melt in the dry edge of the k^ase^oa color after finishing the blend, the clearcoat wi take care of this.

13. Allow the final coat of basecoat color to flash for *at* least 15 minutes, but no longer than 12 hours, e ob f e applying the clearcoat

14. Mix two component clearcoat. Refer to product label instructions.

15. Apply two or three medium wet coats of clear over F toe entire panel. Use 276-345 kPa (40-50 psi) of ai r Pressure at the gun. Allow five to ten minutes tiasn hme between coats.



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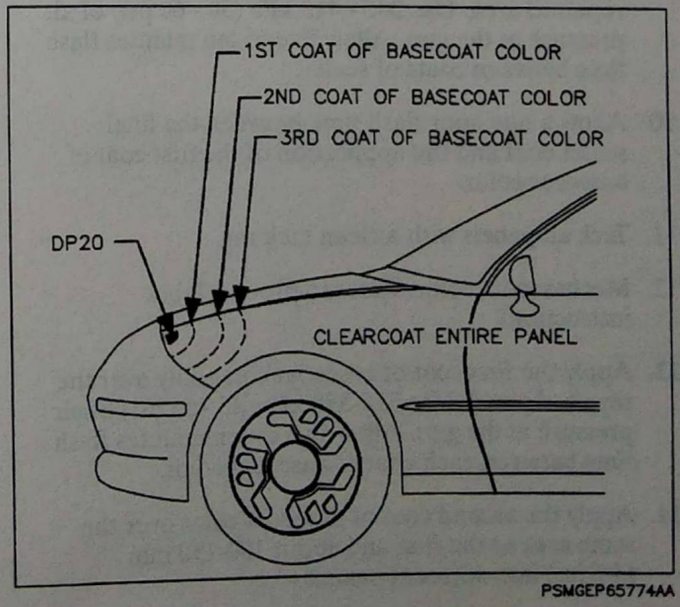

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BASECOAT/CLEARCOAT PANEL REPAIR

Often to achieve a perfect color match when painting a replacement panel or spraying color to the edge of a repaired panel, it may be necessary to blend the basecoat into the adjacent panel or panels.

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1. Wash the entire panel and surrounding panels with water and a mild detergent soap, rinse thoroughly and wipe dry.
2. Clean all panels with PPG DX330 Acryli-Clean or equivalent.
3. Prepare all damaged and bare panel areas. (Refer to the "Undercoat Procedure" section for details.)
4. Sand the repaired panel. Wet sand with 400 grade (or finer) sandpaper or dry sand with 320 grade (or finer) sandpaper.
5. Thoroughly sand the entire area with 1200 grade (or finer) sandpaper.
6. Clean all panels with PPG DX103 Multi-Prep Cleaner to remove the sanding residue.
7. Use an air blow gun to remove all dirt from the cracks and surfaces of panels.
8. Tack all panels with a clean tack rag.
9. Apply one or two medium wet coats of sealer over repaired area. Use 345 - 413 kPa (50 - 60 psi) of air pressure at the gun. Allow five to ten minutes flash time between coats of sealer.
10. Allow a one hour flash time between the final sealer coat and the application of the first coat of basecoat color.
11. Tack all panels with a clean tack rag.
12. Mix basecoat color. Refer to product label instructions.
13. Apply the first coat of basecoat minr ~ i repaired panel. Use 310-379 kPa (45 pressure at the gun. Allow five to tin tune between each coat of basecoSo?
14. Apply the second coat of basecoat same area as the first and about M0 it" (4-6 in.) into adjacent panels.
15. Apply the third coat (if needed) over th area as the (4-6 in.) beyond where the second Normally two or three coats are hiding.
16. Allow the basecoat color to flash fo 15 minutes, but no longer than 12 hou applying clearcoat.
17. Apply two or three medium wet coats nr , all panels. Use 276-345 kPa (40-50 lbsj f pressure at the gun. Allow ten minutes fl between coats.

PROCEDURES FOR PAINTING INTERIOR PLASTICS PARTS

Interior plastic replacement parts for service ar shipped molded in color from the factory. Upon of the part, it will be necessary to inspect the part shipping damage. If at anytime during the inspect process defects are found, the following procedure " developed for repairs.

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1. Wash part with mild soap and warm solution to remove any waterborne contaminants.
2. Rinse the part thoroughly with clean fresh warm water and dry off.
3. Wash entire panel with PPG DX103 Multi-Prep Cleaner or equivalent to remove any surface contaminants.
4. Thoroughly dry the panel before the multi-prep cleaner evaporates.
5. Select the interior color from the appropriate formulas and make a sample spray out to confirm that the color and gloss levels match that of surrounding interior parts while the adhesion promoter is drying. This is an important step as interior colors often vary as the result of subs r texture and configurations.
6. Apply one medium wet coat of PPG DPX 800 Polypropylene Primer or equivalent over a plastic areas.
7. Allow 10 to 15 minutes dry time before app color coat.
8. Apply one or two medium wet coats to the entire part ensuring that full hiding follow achieved and the surface is uniformly w label directions for proper mix and dry and recommendations based on the reduce spray conditions when the material is applied.
9. After allowing the panel to fully he installed according to the service instructions.

AVAILABILITY OF COLORS FOR PAINTING INTERIOR PLASTIC PARTS

Interior colors are color keyed to trim code combination numbers located on the Service Parts Identification Label. This label can be found on the underside of the rear compartment lid.

Conventional interior acrylic lacquer colors are designed for use only on hard trim parts, such as:

- Hard ABS plastic (no primer necessary)
- Hard polypropylene plastic (special primer required)

Each major paint supplier provides an interior color chart which identifies the stock number, color name, glass factor, trim code combination number for each conventional interior color.

PLASTIC REPAIR

REPAIR VERSUS REPLACE

The decision to repair versus replace will depend on the severity of the damage, regional labor rates, seasonal work volume, and OEM parts costing. It is the intent of Saturn Service Parts Operation (SSPO) to provide crash parts at a cost which will allow cost effective replacement of all level 4 and some level 3 damage.

Damage Level	Description	Repair
Level 1	Paint scratch	Finesse or refinish
Level 2	Gouge in plastic	Fill and refinish
Level 3	Crack or puncture	Reinforce, fill and refinish
Level 4	Severe or multiple damage	Replace and refinish

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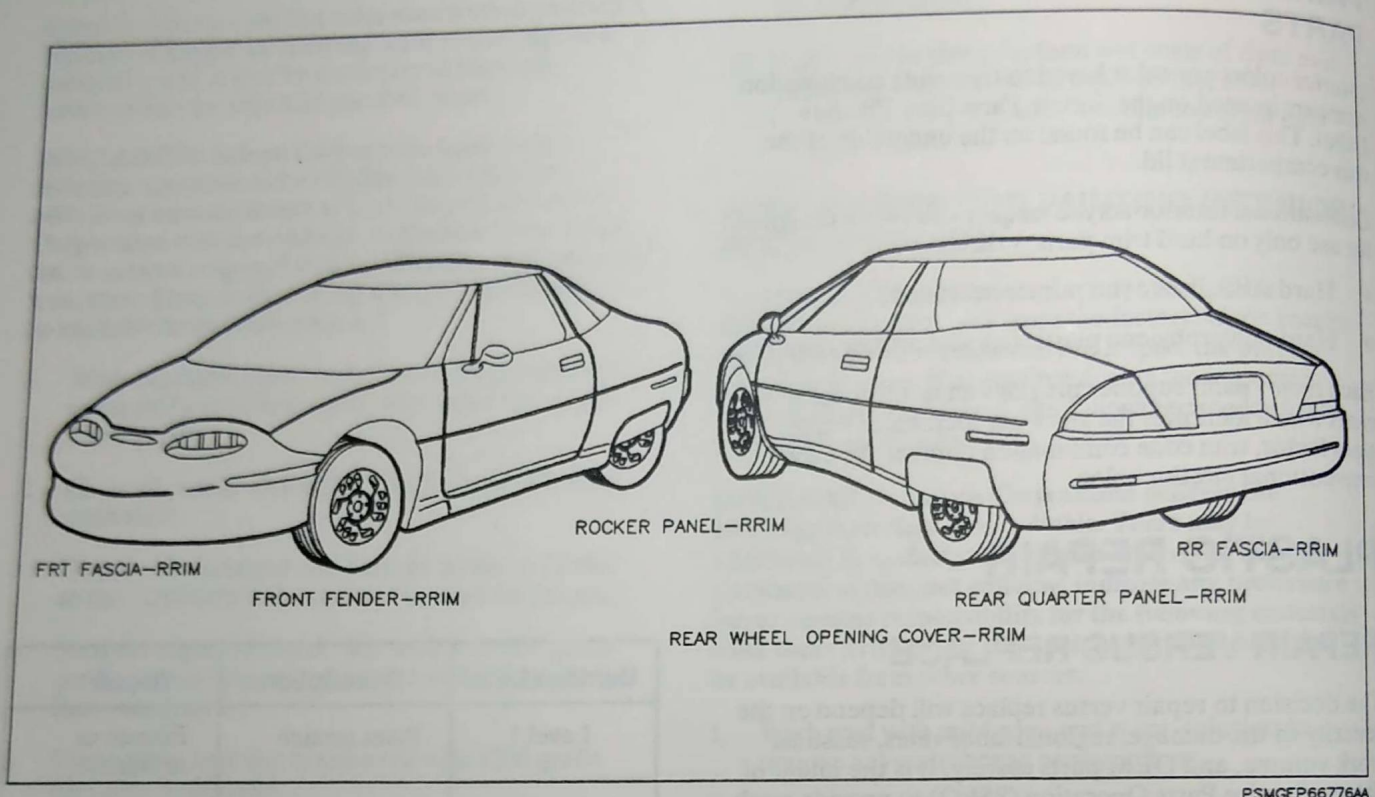
REPAIRING RRIM



Reinforced reaction injection molded (RRIM) parts are becoming more common. RRIM is usually found in quarter panels, fenders and bumper covers.

RRIM is a two-part polyurethane composite plastic. Part A is the isocynate. Part B contains the reinforced fibers, resins, and a catalyst. The two parts are first mixed in a special mixing chamber, then injected into a mold. Since RRIM is a thermosetting plastic, heat 38-60°C (100 to 140°F) is applied to the mold to cure the material. The molded product is made to be stiff yet flexible. This allows RRIM to absorb minor impacts without damage and this makes it an ideal material to use for exposed areas such as front fenders, bumpers, quarter panels, and front and rear *fascias. Although minor impacts* might not dent RRIM, damage will likely occur in a heavier collision.

Gouges and punctures can be repaired using a structural adhesive. If the damage is a puncture that extends through the panel, a backing patch is required.

DISCLAIMER: Saturn Corporation believes the following materials to be reliable. There may be additional manufacturers *of such materials. Saturn Corporation does not* endorse, indicate any preference for, or assume responsibility for the *following materials* from these firms or for any such materials which may be available from other *sources.*

LEVEL 1

Refer to refinish section for detailed instructions.

LEVEL 2

Cosmetic damage, minor scratches and gouges.

1. Clean repair area with soap and water followed by an isopropyl cleaner. Wipe dry.
2. Grind approximately 100-150 mm (4-5.9 in.) around the actual damage with grade 80 on a D-A sander to obtain a ta r for be a?eS'on'If1 he Souge is vei? deep, a grade 36, 75 mm (3 in.) 3M® *Roloc* disc may be used, however hpa? owever, be sure to go u over the area with grade 80 to remove heavy grind scratches.
3. Feat r ge t p the offw^h^cka^dX1^31?11^ re air 3nd Sand the repair area itself with 8rade 1S0A *Stikit* gold disc and wipe , testing has determined adhesion to smooth surfaces rather than rough. ,hat epMy or uretae based pi‘‘,ic fites have srcaKr

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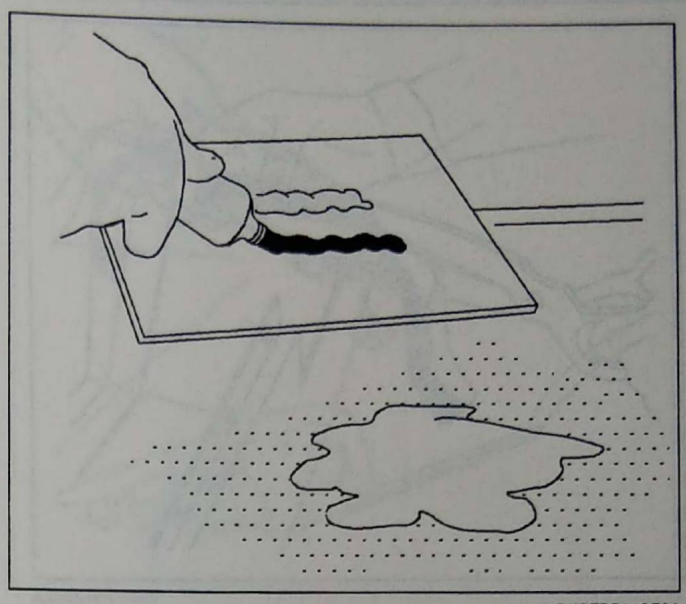
4. Mix3M®> Rigid Plastic Repair Material (RPRM) according to instructions and apply to the repair area with a squeegee or plastic spreader. Build the material slightly higher than the undamaged surface. Allow repair material to cure 20-30 minutes at 16°C to 27°C(60°Fto 80°F).

s When the material is cured, sand with grade 180A *Stikit* gold disc followed by grade 240A *Stikit* gold disc.

n Fill scratches and pin holes with a *skin coat* of 3M® RPRM and sand as in step 5.

7. Apply 1*2 coats of PPG DCP-21 Urethane Primer or equivalent over the repaired area. Air dry for 1-2 hours at 16°C to 27°C (60°F to 80°F), or bake at 61 °C (140°F) for 30 minutes. Lightly scuff sand with grade 320A *Stikit* gold disc. Wipe with dry cloth.

8. Apply primer surfacer as outlined in panel refinish and block sand.



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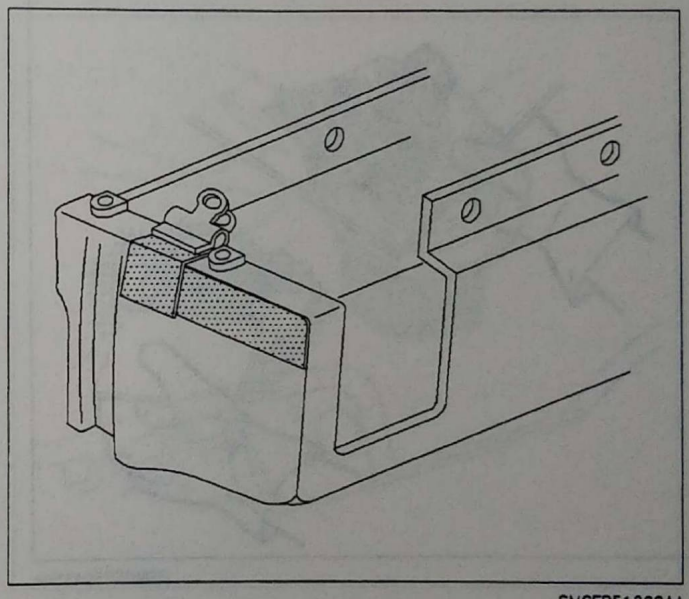
LEVEL 3

Damage in the form of small cracks or punctures.

When minor holes or punctures are large enough to allow repair filler to escape, apply autobody repair tape to the underside of the repair. If holes, punctures or cracks are extensive and require permanent reinforcement, structural strength may be restored as follows.

IMPORTANT: For damage with cracks, drill a 3 mm (1/8 in.) hole at each end of crack to prevent further cracking.

1■ Clean the backside of the repair area with soap and water followed by grease and wax remover. Wipe dry.



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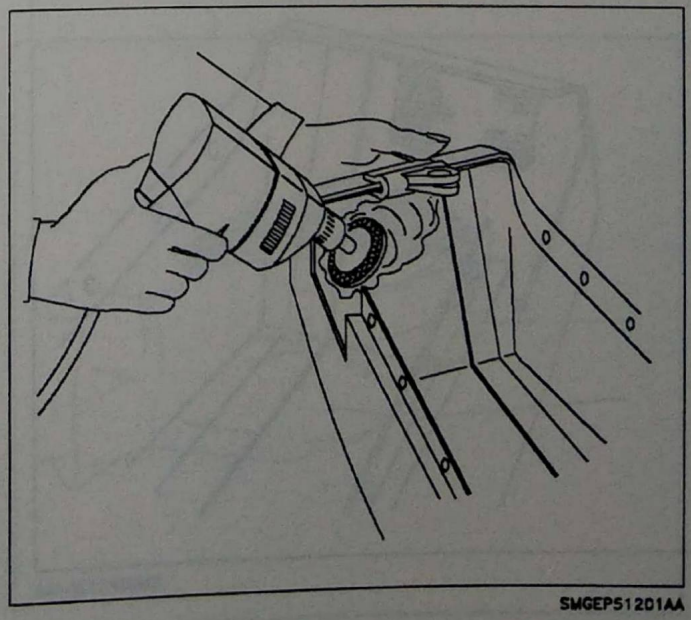
2. Begin repair to inner surface of the panel by abrading the area with a #80 grade disc, (or sand by hand if access is limited).

3. Lse only compressed air or a clean dry cloth to remove residue.



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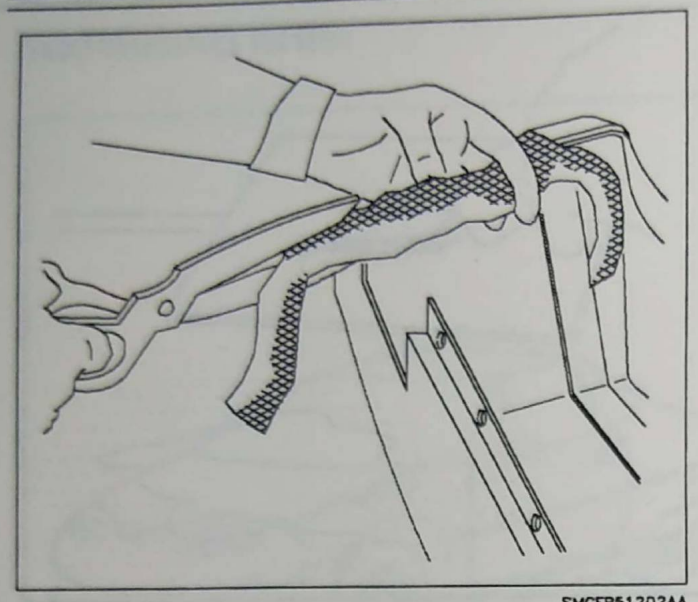

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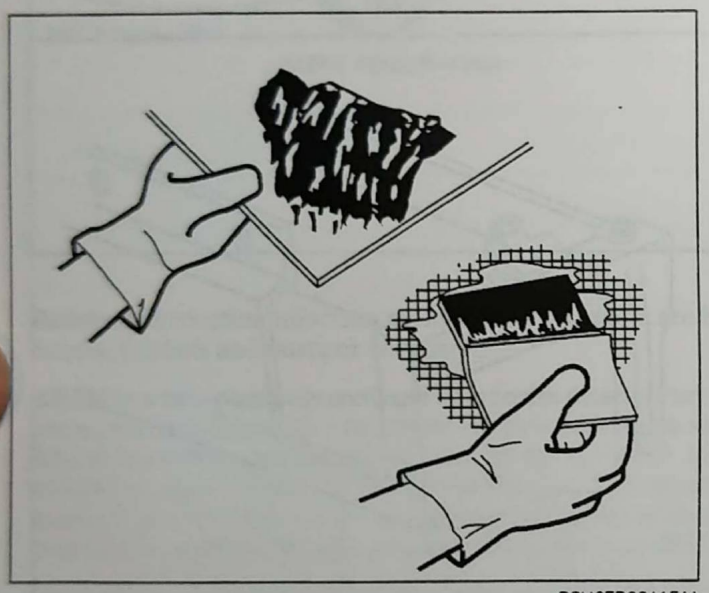
4. Cut a piece of reinforcement mat (porous or unidirectional) to the desired shape.



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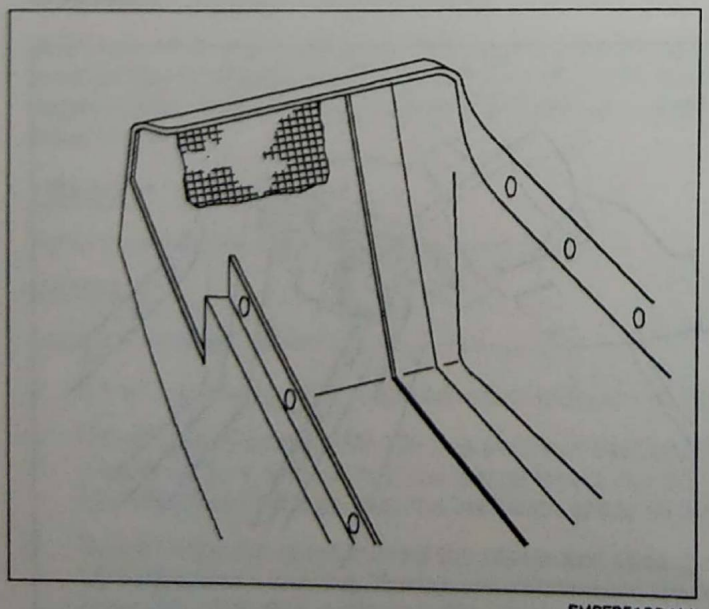
5. Thoroughly mix a quantity of 3M® Structural Adhesive and apply a layer around the damaged area the approximate size of the repair patch.



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6. Lay pre-cut piece of reinforcement mat into the coating of repair material using the applicator to press the mat so that it becomes saturated. Make sure that all trapped air is forced out.
7. If the mat is not an opened type, use a saturation roller to ensure that the mat is completely saturated, and there are no exposed fibers or trapped air.
8. Apply a second coat of flexible repair material making sure the mat is completely saturated, and there are no exposed fibers or trapped air.
9. Allow 20 to 30 minutes cure time at 16°C to 27°C (60°F to 80°F).
10. Remove the tape or clamps used for maintaining alignment and contours.

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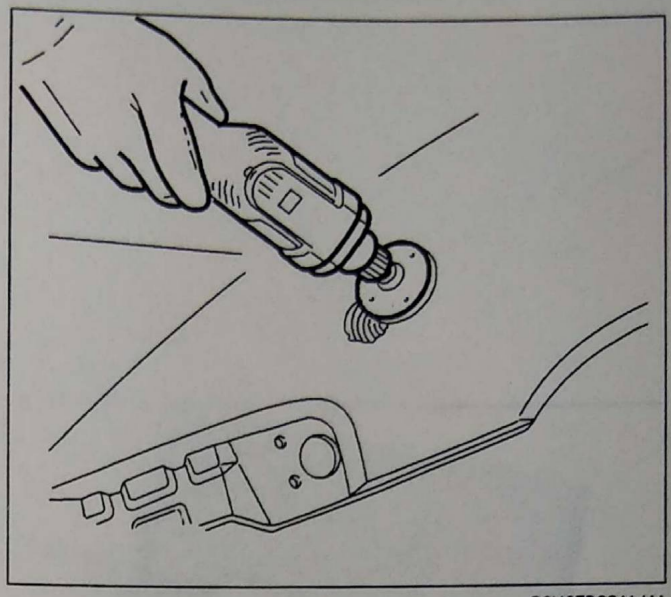
11- At the outer surface of the panel, bevel the damaged area with a #50 grade disc on a Roloc sander. This extends the contact area between the repair Material and the substrate.



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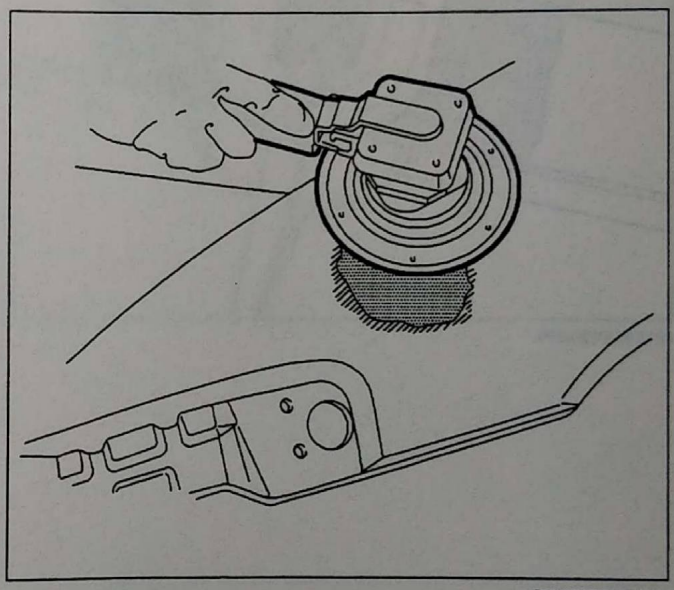
12. Using a #80 grade disc on a D.A. sander, feather out several inches beyond the damaged area to remove any paint or primer from the substrate. This allows a proper surface for adhesion.

13. Apply a light coat of repair material to the damaged area, taking care to apply smoothly. The repair material should be level slightly above the surrounding contour.

14. Allow the material to cure a recommended by the manufacturer.

15. Rough out the surface with a #80 grade disc on a D.A. sander.



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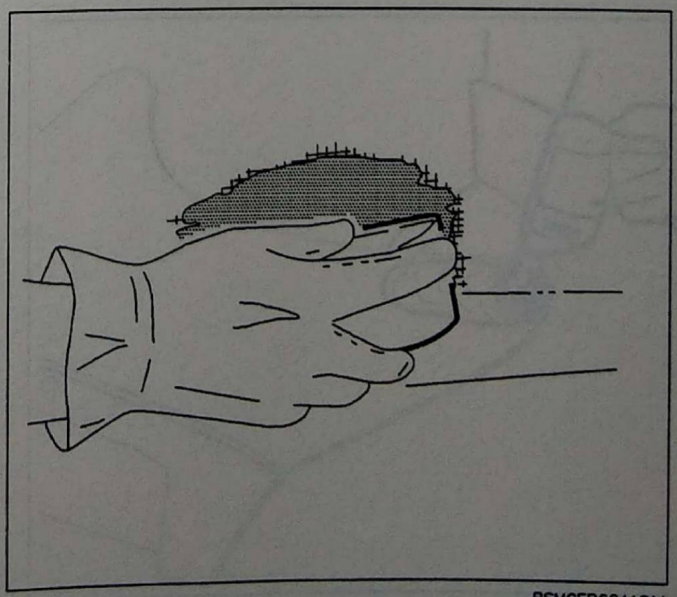
16. Finish contour sanding with a #220 to #320 grade wet or dry sandpaper on a sanding block.



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SHEET MOLDED COMPOUND - REAR COMPARTMENT LID, ROOF HOOD

STRUCTURAL REPAIRS

Damage to body panels, such as cracks or holes that pass completely through the panel is referred to as "structural damage." This type of damage generally affects the strength and structural integrity of the SMC plastic. All structural repairs require the use of backing strips or patches to provide the strength (rigidity) required to restore structural integrity. The patch also provides a foundation to build and form the exterior surface to match the original contour.

Structural adhesives should be used to prevent cracking under stress produced by vehicle movements.

STRUCTURAL BACKING STRIPS OR PATCHES

Backing strips or patches can be scrap pieces of panel, or layers of reinforcement mat (porous or unidirectional), saturated with the recommended structural adhesive. If holes, punctures or cracks are extensive and require permanent reinforcement structural strength may be restored as follows.

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1. Clean and inspect the damaged area as required.
2. Support and align as necessary.
   (minor damage - with tape)
   (major damage — with clamps and brace)
3. Begin reinforcement repair to the inner surface of the panel by scuffing the area with a #80 grade disc, (or sand by hand if access is limited).

NOTICE: It is not desirable to heavily abrade the substrate of SMC panels.

4. Use only compressed air or a clean dry cloth to remove residue.
5. Panels requiring splicing of sustaining major damage may need a reinforcement panel or patch panel, possible, obtain this part by cutting a piece from t original damaged material.

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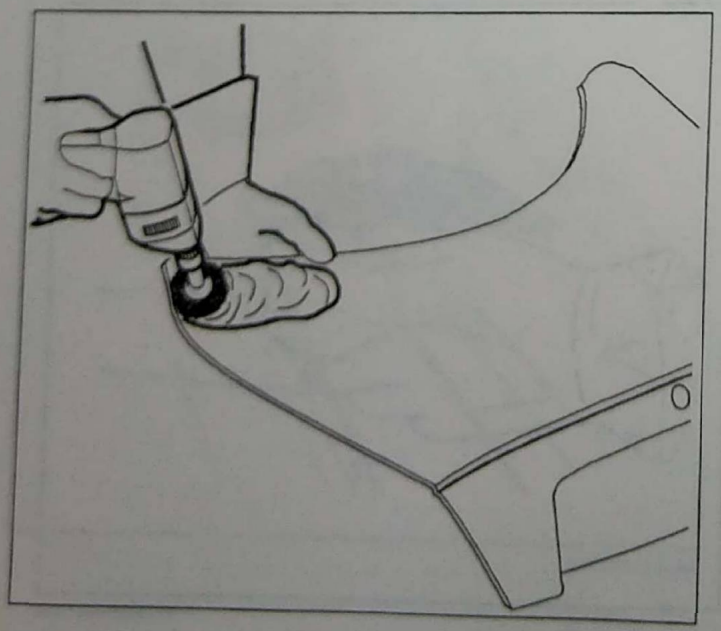

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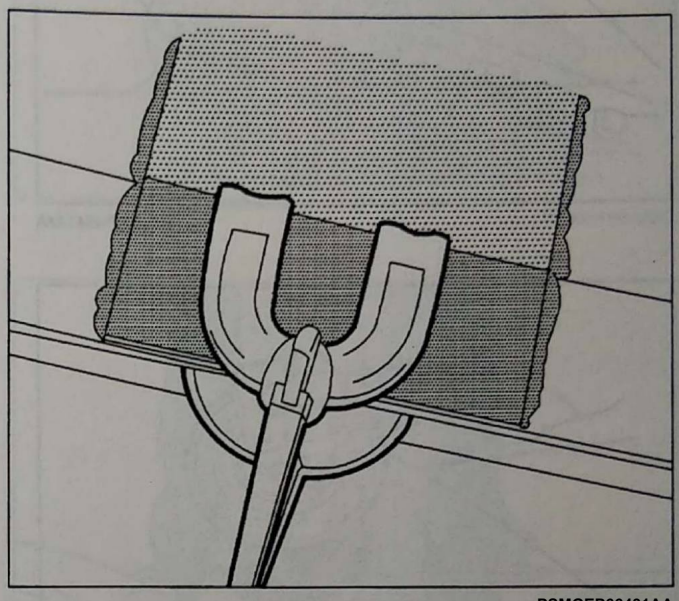
6- If a piece of the original damaged panel is used for reinforcement backing, be sure the surfaces are sanded and cleaned to completely remove any paint or finish material because it will inhibit proper bonding-

7. if the damaged area is small, cut a piece of reinforcement mat to the desired shape. Extend the mat 100-150 mm (4-5.9 in.) beyond either side of the repair area.

8. Apply a skim coat of 3M® SMC Adhesive, or its equivalent.

9. Lay the back panel onto the coat of bonding epoxy and use clamps or props to apply slight pressure until curing is completed.



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10. Do not use excessive force because this may cause distortion of the panel, and may also squeeze out the epoxy.

11. If a pre-cut piece of reinforcement mat is used in the repair, press it into the skim coat of bonding epoxy using the applicator to press the mat so that it becomes saturated, and all trapped air is forced out.

12. If the mat is not of the screen type, use a saturation roller to ensure that the mat is saturated. Make sure that all trapped air is forced out.

13. When using a backing panel from the original damaged panel or when using a pre-made rigid backing panel to reinforce the repair area, make sure there are no voids at the edges of the repair area that may allow entry of water or chemicals.

14. When using a piece of reinforced mat material for backing, apply a second coat of bonding epoxy, making sure the mat is completely saturated and there are no exposed fibers or trapped air.

15. Allow to cure as required in the manufacturer's instructions.

16. Bonding epoxy can be force dried at temperatures of 66°C minimum to 121 °C maximum (150°F minimum to 250°F maximum) for 45 minutes.

17. ■ Force drying speeds cure time and increases bond strength. Use a uniform heat source.

18. Remove the tape or clamps used for maintaining alignment and contours.

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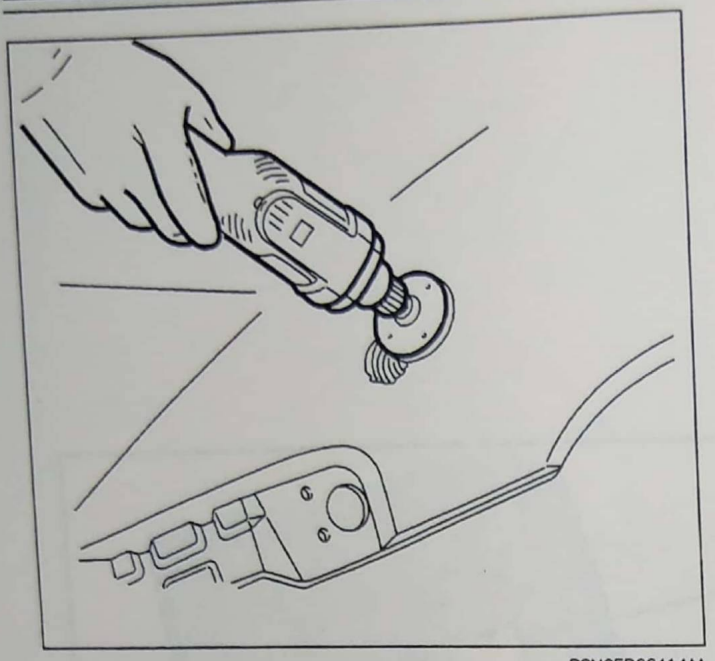

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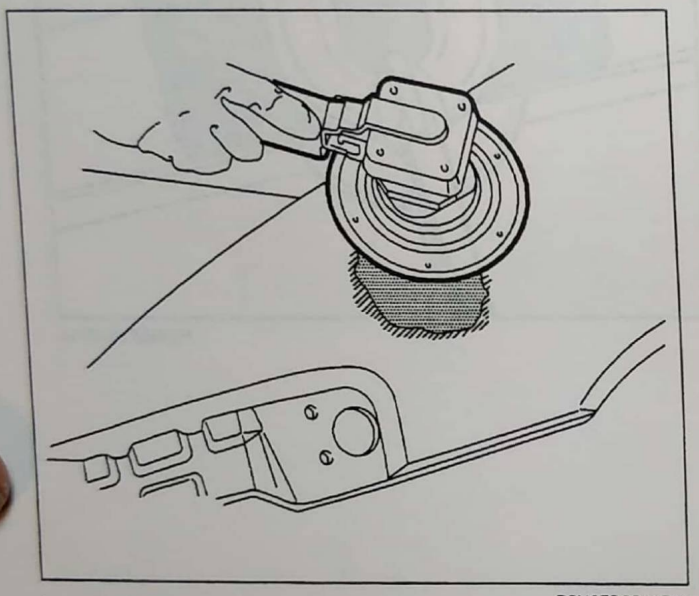
19. At the outer surface of the panel, bevel the damaged area with a #50 grade disc on a Roloc sander. This step extends the contact area between the repair material and the substrate.



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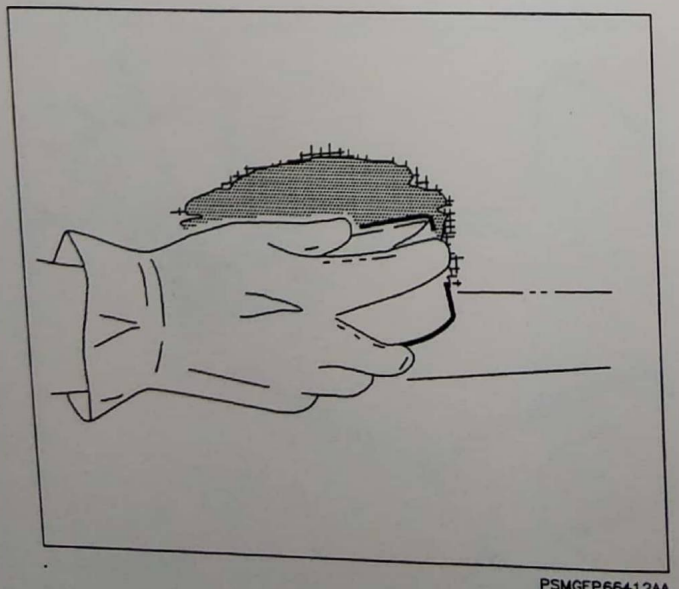
20. Using a #80 grade disc on a D.A. sander, feather out several inches beyond the damaged area to remove any paint or primer from the substrate. This allows a proper surface for adhesion.



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21. Apply a light coat of 3M® SMC Adhesive, or its equivalent to the damaged area.

22. Take care to apply the repair material smoothly, also the repair material should be at a level slightly above the surrounding area.

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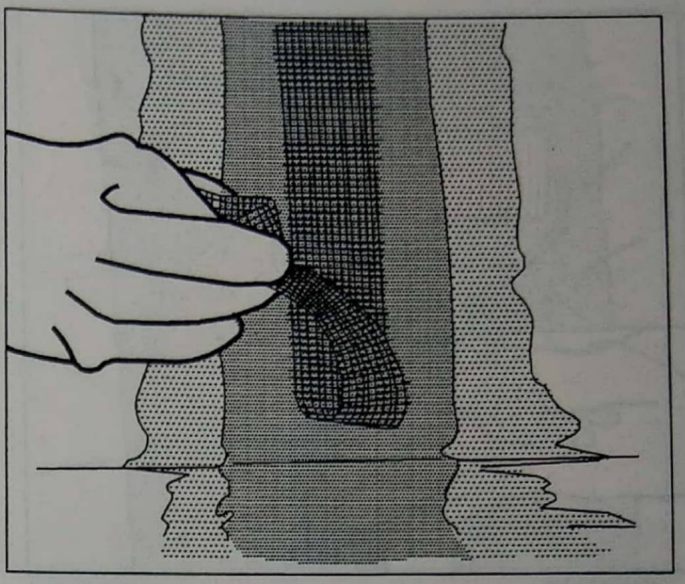
23. Lav a prc'cut Piece of re*nforccment mat into the bonding epoxy. Use the applicator to saturate, and remove all trapped air.



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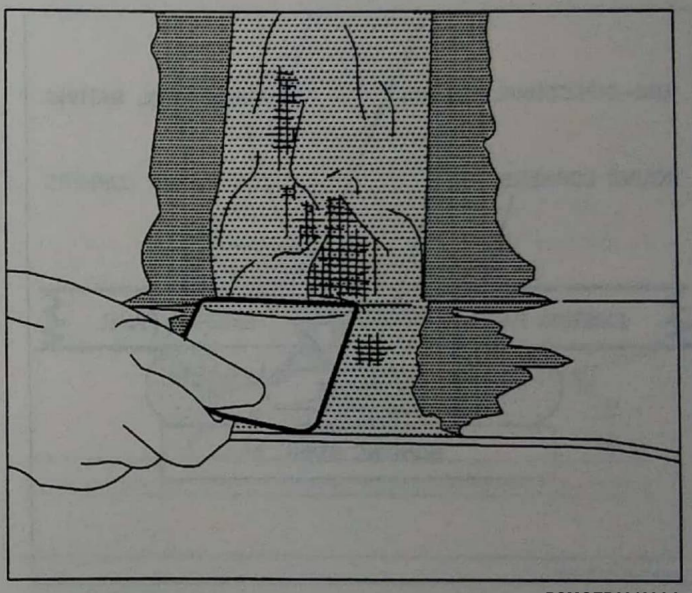
24. Apply a second coat of bonding epoxy, making sure the mat is fully encapsulated, and no air is trapped. Smooth the surface with the applicator.



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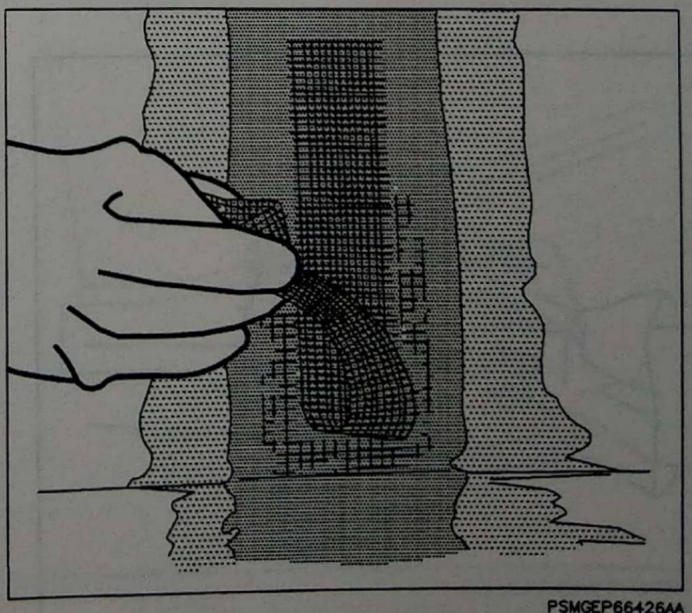
25. Place a second layer of reinforcement mat over the second coat of bonding epoxy, working it smooth and removing all trapped air.



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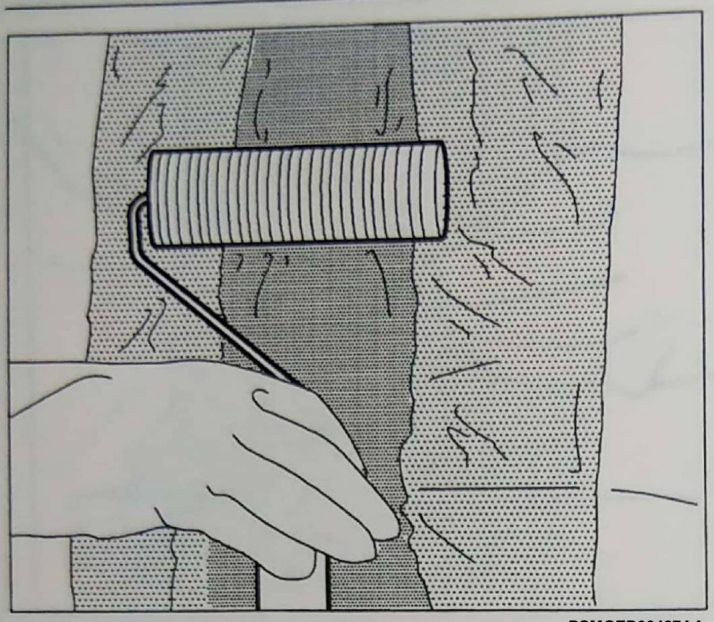

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26. Apply a final coat of bonding epoxy, and pl$_{ac}$ sheet of wax paper over it. Use the saturation^{6}— to ensure full penetration of bonding epoxy mat.

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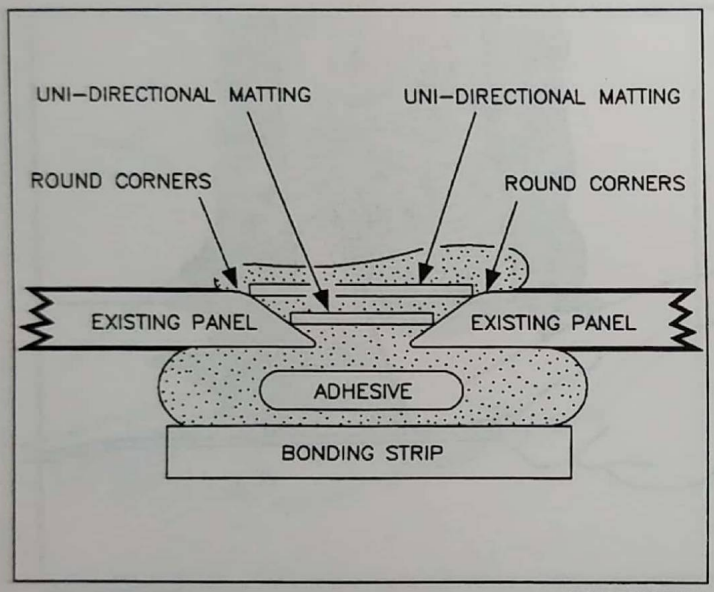

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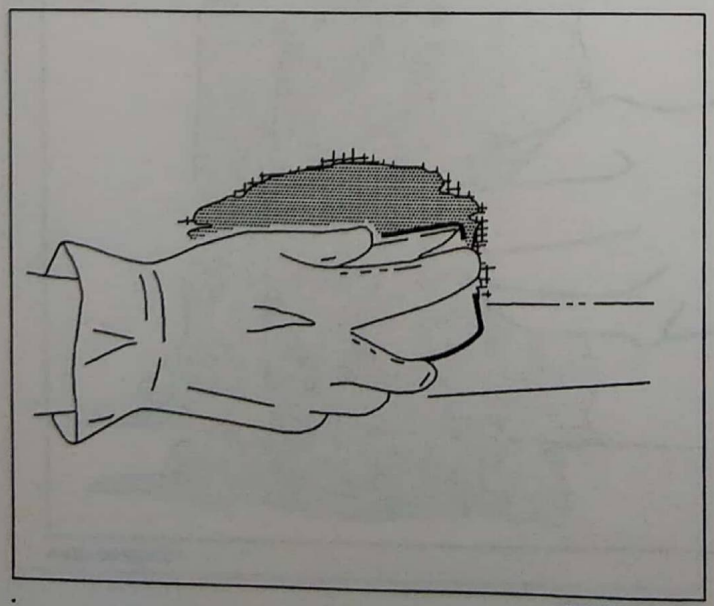
27. Cure the repair materials by force drying for 45 minutes at no more than 121 °C (250°F).

28. If a second coat of bonding epoxy is necessary, it does not require saturation rolling, but it does require force drying a 121 °C (250°F) or less for 45 minutes.

29. Rough out the surface with a #80 grade disc on a D.A. sander.



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30. Finish contour sanding with a #220 to #320 grade wet or dry sandpaper on a sanding block.

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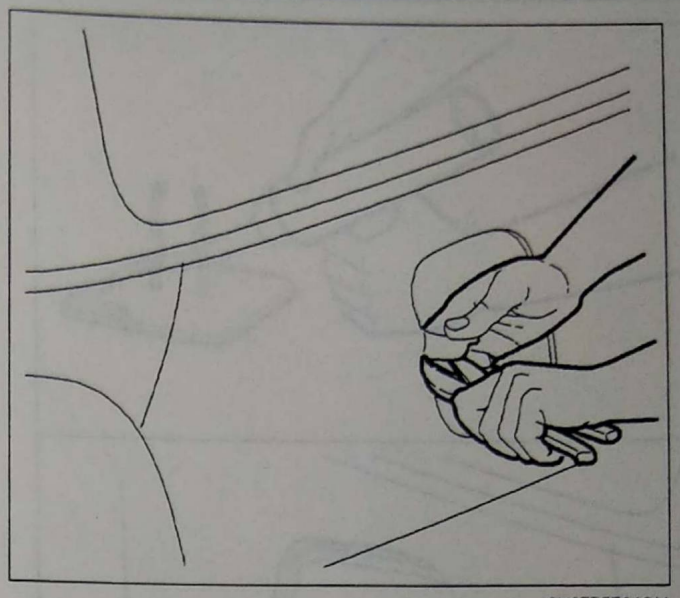
rRACKS OR HOLES WITH REAR OF ^EL ACCESSIBLE

1. Cut away damaged material using tin snips or a similar tool.
2. Trim loose fiberglass strands.



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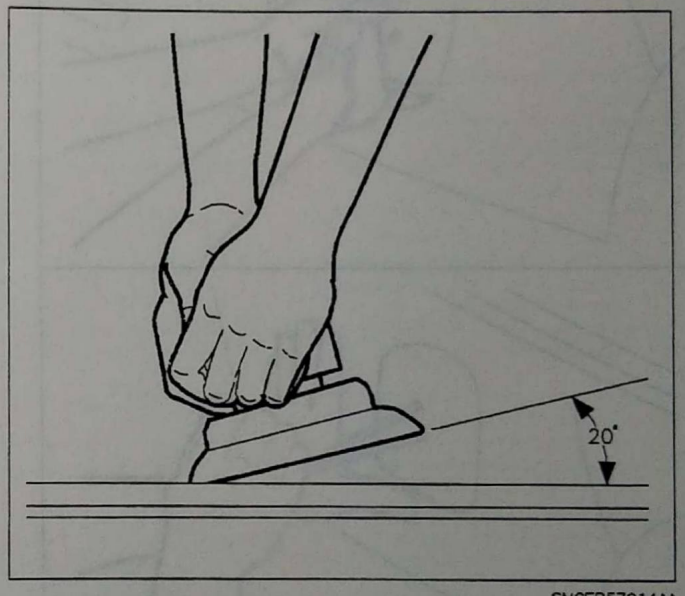
3. Sand paint from around damaged area. Inspect area again for signs of other damage.
4. Grind or file a taper at the edge of the damaged area. The taper should have a shallow pitch for maximum bonding surface. A disc grinder with a vacuum attachment will minimize the dust problem.



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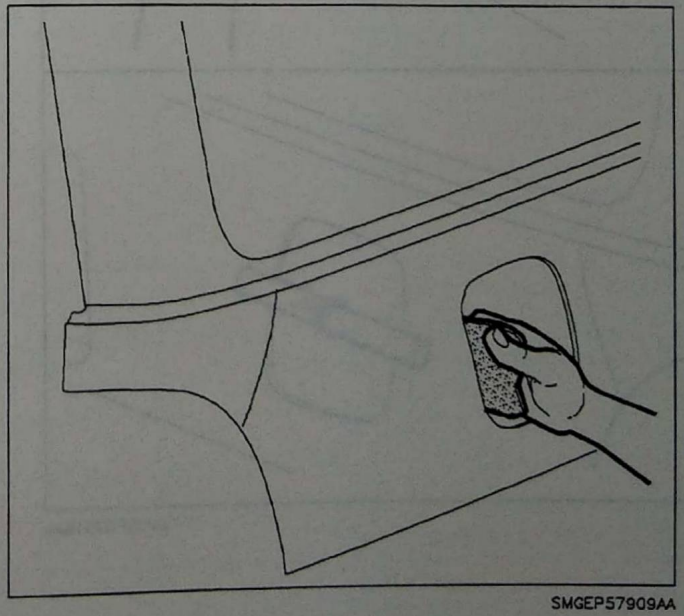
5. Reach through the hole, clean and sand back side of damaged area to provide a good bonding surface for the backing patch. Cleaning solvent should not leave any deposit on bonding surface. Follow manufacturer's instructions for SMC clean-up as some solvents leave a residue that could negatively affect the structural integrity of the adhesive after the repair has been made.



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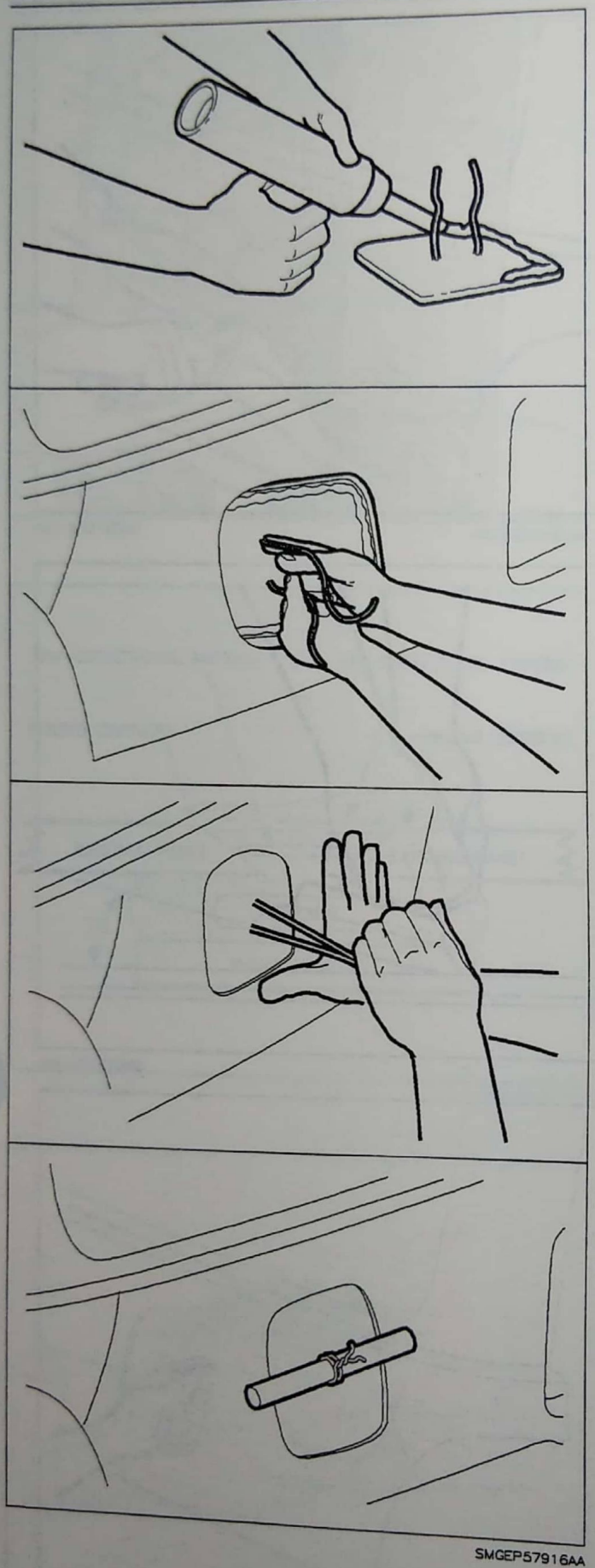

6. Prepare patch as previously described under "Structural Backing Strips or Patches."

7. Drill two holes in the center of the patch approximately 19 mm (3/4-in.) apart. Thread a piece of waxed wire through the holes to assist holding patch in place after installation.

8. Apply an 8-10 mm (5/16-25/64 in.) bead of bonding adhesive to the edge of the patch. Slip patch through the hole, then pull the patch into place using the wire. Pull firmly to spread the adhesive evenly.

9. Allow adhesive to cure according to manufacturer's directions.

10. When adhesive is fully cured, fill the exterior of the damaged area with two-part epoxy filler.

11. Finish the repair by grinding, sanding, and painting in the usual manner.

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COSMETIC REPAIRS

SCRATCHES

In many cases, a scratched panel will involve only a paint finishing job, in which case the following procedure should be used:

1. Feather-edge the repair area with 220 grade wet or dry sandpaper and finish block sand with 320 grade wet or dry sandpaper.
2. Clean repair area using cleaning solvent.
3. Protect surrounding panels by masking before performing paint refinishing operations. Use only non-staining type masking tape on SMC panels. *
4. Refinish panel in the usual manner.

GOUGES

In some cases, the damaged area requires a plastic build-up to establish the original contour of the body. If the SMC is not pierced through, the repair procedure is as follows:

1. Remove all paint from surrounding area by sanding.
2. Scuff sand the area surrounding the damage to provide a good surface.
3. Clean repair area using cleaning solvent.
4. Mix two-part epoxy filler according to manufacturer's instructions.
5. Apply filler using a plastic or rubber squeegee.
6. Allow filler to cure according to manufacturer's directions.
7. Finish the repair by grinding, sanding, and painting in the usual manner.

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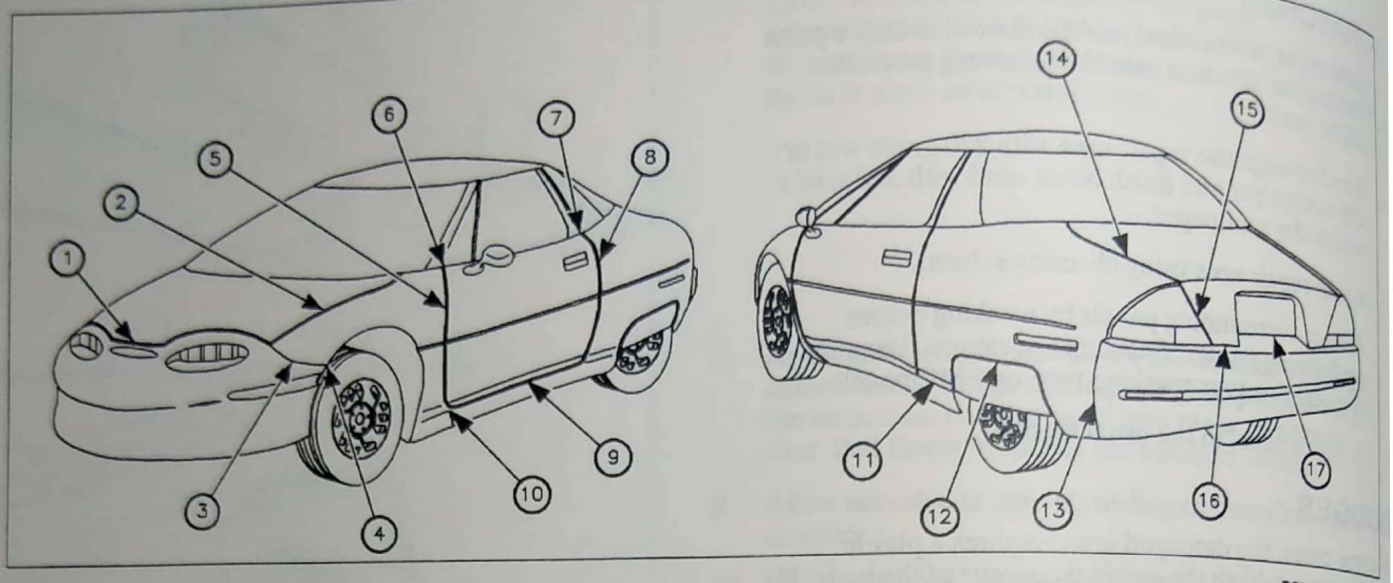
CLEARANCEAND FLUSHNESS SPECIFICATIONS



Location	Clearance Gap mm (in.)	Flushness mm (in.)
1. Front fascia to hood	4.0 ± 1.0 (0.16 ± 0.04)	±1.0 (±0.04)
2. Front fender to hood	4.0 ± 1.0 (0.12 ± 0.04)	±1.0 (±0.04)
3. Front fender to front fascia	0.0 to 0.75 (0.0 ± .03)	±0.5 (±0.02)
4. Front fender to front fascia in the wheel opening	Fore/Aft Align Even to 0.0/−2.0 (0.0 ± 0.08)	0.0 to −2.0 (0.0 ±0.08)
5. Front fender to door assembly	5.0 ± 1.0 (0.20 ± 0.04)	Flush to 1.5 under Flush (0.06)
6. Fender – Up/Down alignment at front top	----	Even ±1.5 (±0.06)
7. Front door assembly to quarter panel – Up/Down alignment at rear top	----	Even ±1.5 (±0.06)
8. Front door assembly to quarter panel	5.5 ± 1.0 (0.2 ± 0.06)	Quarter under flush 0.75 ± 0.75 (0.03 ± 0.03)
9. Front door assembly to rocker panel	7.5 ± 1.5 (0.30 ± 0.06)	Door 1.5 (0.06) under flush ± 1.5 (±0.06)
10. Front fender to rocker panel	5.0 ± 1.5 (0.20 ± 0.06)	Flush 0.0/−1.5 flush (0.06)
11. Quarter panel to rocker panel	Up/Down Gap 6.0 ± 1.5 (0.24 ± 0.06)	----
12. Wheel skirt to quarter panel, front, top, and rear of skirt	4.0 ± 1.0 (0.1 ± 0.04)	1.0 (0.04) over flush – Quarter panel to fender skirt ± 1.0 (±0.04)
13. Quarter panel to rear fascia	0.0 to + 0.75 (0.0 to 0.03)	Flush – Quarter panel to rear fascia ±0.5 (0.02)
14. Quarter panel to compartment lid	Forward gap 4.0 ± 1.0 (0.16 ± 0.04) Rearward gap 5.0 ± 1.0 (0.20 ± 0.04) Gap cross car 6.5 ± 2.0 (0.20 ± 0.04)	----
15. Tail lamp to compartment lid	6.5 ± 2.0 (0.26 ± 0.08)	----
16. Compartment lid to rear fascia outboard of license pocket	6.0 ± 2.0 (0.24 ± 0.08)	----
17. Compartment lid to rear fascia at license pocket	6.0 ± 2.0 (0.24 ± 0.08)	----

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THERMAL EXPANSION

rhc EVI uses thermoset plastic exterior body panels for durability' Thermoset plastic body panels are made of lightweight corrosion resistant materials which stand up wel| to most minor impacts and dents. 1 hermoset plastics ha''c growth factors similar to steel, which are minimal.

Thc EVI exterior panels do not require management or control of this p pe of panel movement.

ADHESION - MOLDINGS, WEATHERSTRIPS AND EMBLEMS

Bodv side moldings and emblems that are attached to body panels with adhesive tape require preparation prior to replacement. To ensure a good molding (new or old moldings) or emblem replacement, the panel surface should be warm, 21° to 32 °C (70° to 90 °F), clean and free of any wax or oily film.

SECURE LOOSE MOLDING

1. Wash affected area with soap and water and wipe dry. Wipe panel and adhesive side of molding with a clean rag using oil-free naphtha or alcohol. If molding has pulled loose from adhesive backing (tape remains on body panel), do not remove tape from body. Clean back of molding and tape on body with oil-free naphtha or alcohol.
2. To be certain that the molding is straight, masking tape may be applied as a molding guide. A straightedge may also be used in most cases.

NOTICE: Do not allow loctite to drip or run onto exposed painted surfaces.

3. Apply Loctite 414 adhesive GM P/N 12345093, or equivalent, to back of molding and press in place.

MOLDING REPLACEMENT

1. Wash affected panel area with soap and water and wipe dry. Remove all traces of adhesive from body panel and back of molding using oil-free naphtha or alcohol.
2. Mark proper position of molding with a length of masking tape. Use adjacent moldings as a guide, if applicable.
3. If vehicle body is below 21° to 32°C (70° to 90 F)° due to shop temperature or outside temperature, warm the body panel with a heat gun before Proceeding with step 4.

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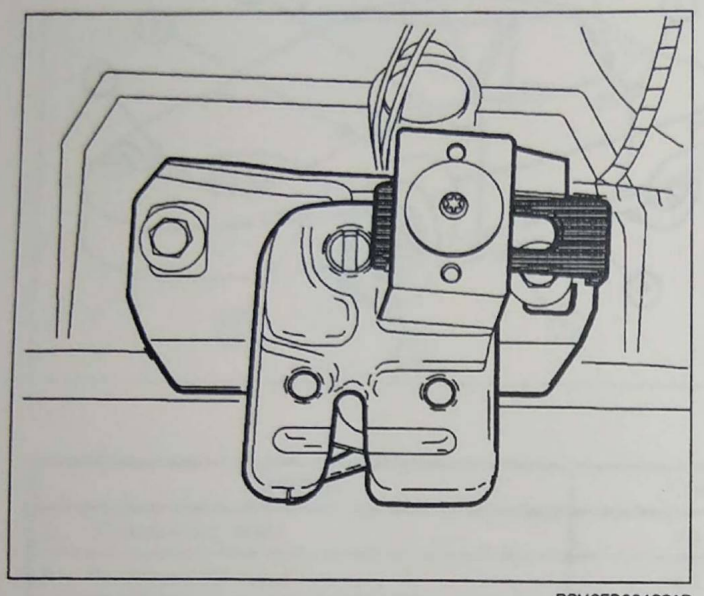
4. Apply a double-coat acrylic foam tape such as 3M Super Automotive Attachment Tape P/N 06380 (which has a white backing), or P/N 06382 (which has a gray backing), or equivalent, on the molding.
5. Align molding to tape guideline and press firmly in place.



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REAR COMPARTMENT RELEASE LOCKOUT

Your EVl is equipped with a rear compartment release lockout switch to protect any valuables stored in the rear compartment area of the vehicle. When the switch is activated, the rear compartment lid cannot be opened using the remote release lever located inside the vehicle. In this case, the key must be used to open the rear compartment lid from outside the vehicle.

The rear compartment release lockout switch can be easily identify when the rear compartment lid is in the open position. The orange lever on the backside of the lock/latch assembly either activates or deactivates the switch. When the orange lever is moved toward the passenger's side of the vehicle, the inside release handle will not open the rear compartment lid. When the orange lever is moved toward the driver's side of the vehicle, both the inside release handle and the key will open the rear compartment lid.

REPLACEMENT LABELS

Replacement labels are listed in the standard parts catalog and are available through Saturn Service Part Operations for the following:

- Headlamp Adjustment Label
- Tire Pressure Label
- Starting Voltage Caution Label

The Vehicle Certification Label, Price and Fuel Economy Label, Consumer Information Label, and Service Parts Identification Label are NOT available as service parts.

TIRE PRESSURE

The original equipment steel belted radial tires will perform well under normal conditions and loads when inflated as recommended on the Tire Information Label. Do not load the vehicle beyond the load limits (total kilograms or pounds) shown on the tire Information Label. The label indicates the design limits of the vehicle, not just the tire pressures.

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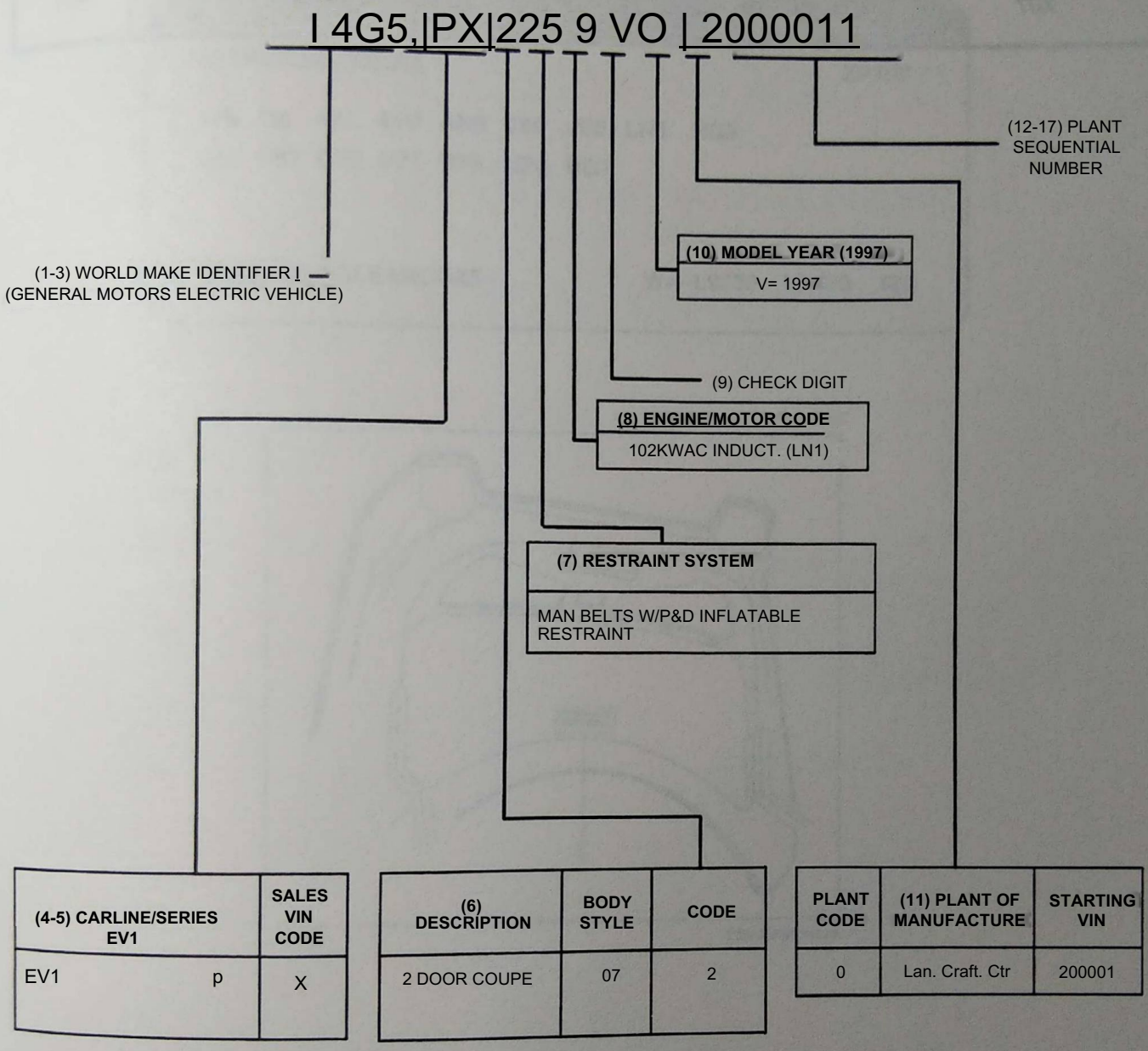
GENERAL INFORMATION

VEHICLE IDENTIFICATION PLATE

The vehicle identification plate, located on the upper instrument panel, is visible from outside the vehicle. This plate contains the following information:

- The vehicle identification number (VIN) is a seventeen digit sequential unit number, prefixed by letters and numbers as explained below.



(4-5) CARLINE/SERIES EV1	SALES VIN CODE
EV1 p	X

(6) DESCRIPTION	BODY STYLE	CODE
2 DOOR COUPE	07	2

PLANT CODE	(11) PLANT OF MANUFACTURE	STARTING VIN
0	Lan. Craft. Ctr	200001

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MODEL IDENTIFICATION

Model and body style for the current year are listed below.

CATALOG MODEL	MERCHANDISING MODEL	DESCRIPTION	SERIES
X07	ZPAOO	2 DOOR COUPE	EV1

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SERVICE PARTS IDENTIFICATION LABEL

rhe following ... ow the service ... Par,s identification label and how to read it. This label provides identification ■ vehicle equipmentt to he | in . en icing and determining replacement parts. Included on this label will be regular juction options (RPOs). standard and mandatory options.

nc label is permanently attached inside the vehicle at the assembly plant.

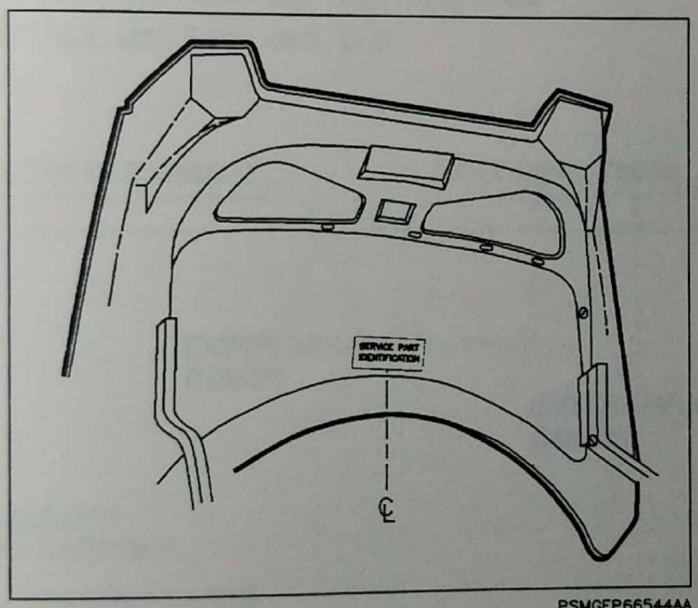
EV1 DO NOT REMOVE

4G5PX2255V005001 ZPX07

12B 121 45L 45U AR9 C59 JEO LN1 NG5

OLF PY7 QEL U71 U79 UPO UG7

BASECOAT-CLEARCOAT WA-L9539 U9539 121



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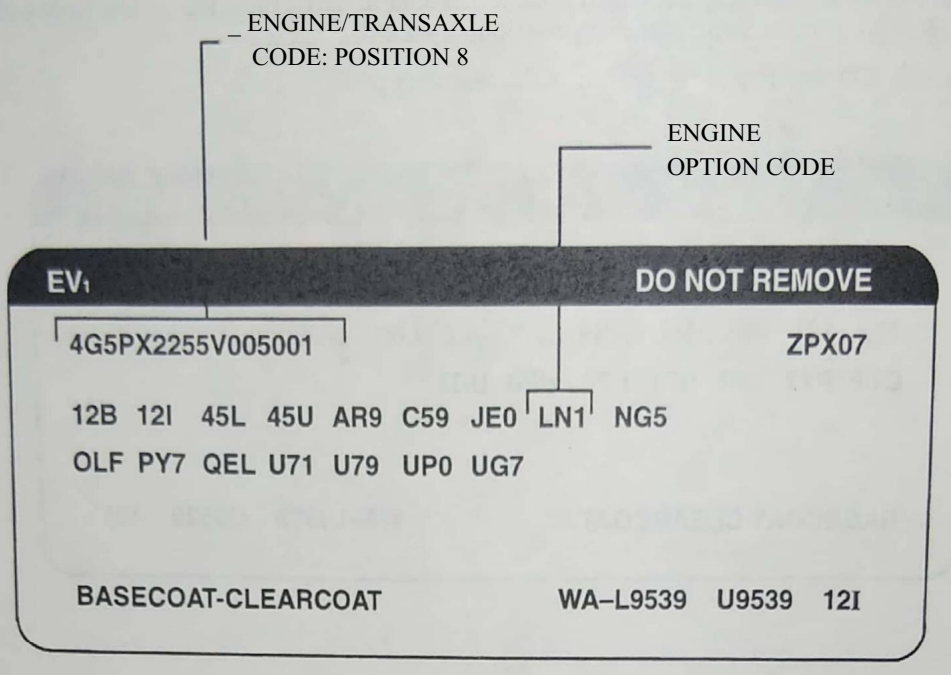
ENGINE AND TRANSAXLE USAGE



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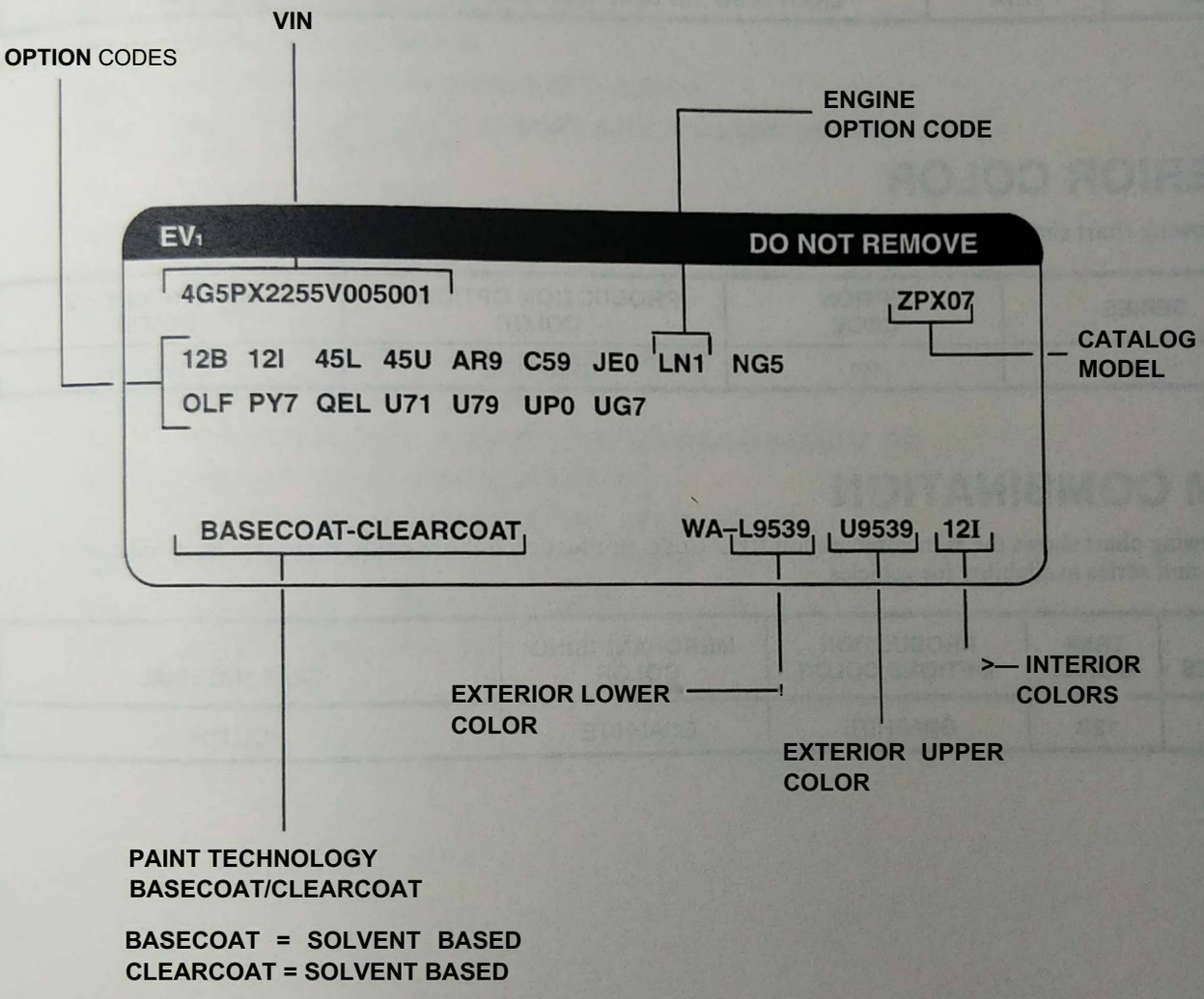
VIN
OPTION CODES
ENGINE
OPTION CODE
EV1
DO NOT REMOVE
4G5PX2255V005001
ZPX07
CATALOG
MODEL
12B 12I 45L 45U AR9 C59 JE0 LN1 NG5
OLF PY7 QEL U71 U79 UP0 UG7
BASECOAT-CLEARCOAT
WA-L9539
U9539
12I
INTERIOR
COLORS
EXTERIOR LOWER
COLOR
EXTERIOR UPPER
COLOR
PAINT TECHNOLOGY
BASECOAT/CLEARCOAT
BASECOAT = SOLVENT BASED
CLEARCOAT = SOLVENT BASED

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EXTERIOR COLORS

The following chart shows the exterior colors, RPO codes, WA codes, series availability for vehicles.

OPTION CODE	WA CODE	COLOR	SERIES
81	8774	BRIGHT RED	EV1
45	9539	MEDIUM GREEN METALLIC	EV1
36	121A	LIGHT ADRIATIC BLUE METALLIC	EV1

INTERIOR COLOR

The following chart shows the interior color, RPO Code, and series availability for EVl vehicles.

SERIES	OPTION CODE	PRODUCTION OPTIONS COLOR	MERCHANDISING COLOR
EV1	121	GRAPHITE	GRAPHITE

TRIM COMBINATION

The following chart shows the trim combination RPO Code, production options color, merchandising color, seat material, and series availability for vehicles.

SERIES	TRIM COMB.	PRODUCTION OPTIONS COLOR	MERCHANDISING COLOR	SEAT MATERIAL
EVt	12B	GRAPHITE	GRAPHITE	CLOTH

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1997 PRODUCTION OPTIONS

OPTION CODES	DESCRIPTION
AR9	SEAT FRT BKT, EUROPEAN STYLE, PASS & DRIVER RECL
C59	HVAC SYSTEM AIR CONDITIONER FRT MAN CONTROLS
JEO	BRAKE ELECTRO HYDRAULIC APPLY FRT & RR ELECTRIC WITH BLENDED REGENERATIVE BRAKING
LN1	ENGINE ELECTRIC MOTOR (102 KW, AC, 312 V)
NG5	EMISSION SYSTEM ALL STATES, ZEU
PY7	WHEEL 14X4.5, ALUMINUM
QEL	TIRE ALL P175/65R14/X BW R/PE ST TL ALS 84S
UPO	RADIO AM/FM STEREO, SEEK/SCAN, AUTO REV, MUSIC SEARCH CASS, CD, AUTO TONE, CLOCK. ETR.
U71	ANTENNA ROOF, RADIO
U79	SPEAKER SYSTEM 4, DUAL FRT COAX, DUAL EXT RGE PKG SHELF
VG7	LABEL INFORMATION
OLF	PLANT CODE
12B	TRIM COMBINATION CLOTH, GRAPHITE (B) (95)
121	INTERIOR TRIM GRAPHITE (95)
36L	SECONDARY COLOR EXTERIOR, LT ADRIATIC BLUE METALLIC(94)
36U	PRIMARY COLOR EXTERIOR, LT ADRIATIC
45L	SECONDARY COLOR EXTERIOR, MED GREEN MET (95)
45U	PRIMARY COLOR EXTERIOR, MED GREEN MET (95)
81L	SECONDARY COLOR EXTERIOR, BRIGHT RED (95)
81U	PRIMARY COLOR EXTERIOR, BRIGHT RED (95)

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EV1 SPECIFICATIONS

OVERALL LENGTH	4309 mm/169.7 in.
OVERALL WIDTH	1766 mm/69.5 in.
OVERALL HEIGTH	1281 mm/50.5 in.
WHEELBASE	2512 mm/98.9 in.
TRACK Front Rear	 1470 mm/57.9 in. 1244 mm/49.0 in.
CURB WEIGHT	1350 kg/2970 lbs
FRONTAL AREA	1.89 sq. m.
DRAG COEFFICIENT	0.19
TIRE SIZE	175/65/14
RATED MOTOR POWER	102 kw/137 hp
RATED BATTERY CAPACITY - 26 Modules/312 Volts - Battery Pack Mass - Battery Module Mass	16.2 kw-hr 533 kg/1175 lbs 489 kg/1078 lbs
RECHARGE TIME (from 15% to 95% state of change) - 220 volt/6.6 kw - 110 volt/1.2 kw	 Approximately 3 hours Approximately 15 hours

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L[pTING, JACKING, AND SUPPORT POINTS

CAUTION: TO HELP AVOID PERSONAL INJURY WHEN A VEHICLE IS ON A HOIST, PROVIDE ADDITIONAL SU FOR THE VEHICLE. THIS WILL RED

ppOR¹ wx 1HE POSSIBILITY OF THE VEHICLE FALLING OFF THE ^IOIST'

CAUTION: TO HELP PERSONAL INJURY, ALWAYS USE JACK STANDS WHEN UNDER ANY VEHICLE IS SUPPORTED ONLY BY A FLOOR JACK OR A HOIST.

XWTMG 0N OR

NOTICE: When lifting with a frame contact hoist, and battery pack removal is not necessary, lift the vehicle on the body side frame-lower pinch weld flanges at specific lift locations. (Location views on next page).

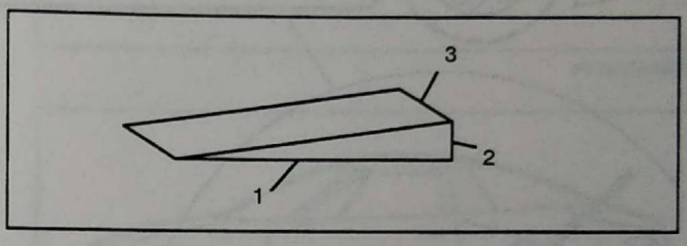
se of iqu n of the EV1 and its ground clearance, it is necessary to follow the two post front and rear hoist, it may be necessary to use either low

&S:?. SxHSFi

profile arms or ra l . . a H ' 2rea t0 ^ee P ^asc² the om being damaged when approaching or &

living the hoisting area. Ramp size needed:

1. **1050 mm in length (41-3/8 in.)**
2. **155 mm in height (6-7/64 in.)**
3. **230 mm in width (9-1/16 in.)**



NOTICE: When lifting **with a suspension contact hoist, position the front hoist lift pads under the lower control** arms. Lift from **under the rear tires for rear suspension. (Refer to "Hoisting/Lifting for a Two Post In Ground Hoist** From and Rear" in this **section for more information and illustrations.)**

> nen batten pack removal is required, the use of two rear lift pad adaptors must be used. These lift pad adaptors are obtainable from:

General Motors Dealer Equipment

Telephone: 1-800-GM-TOOLS

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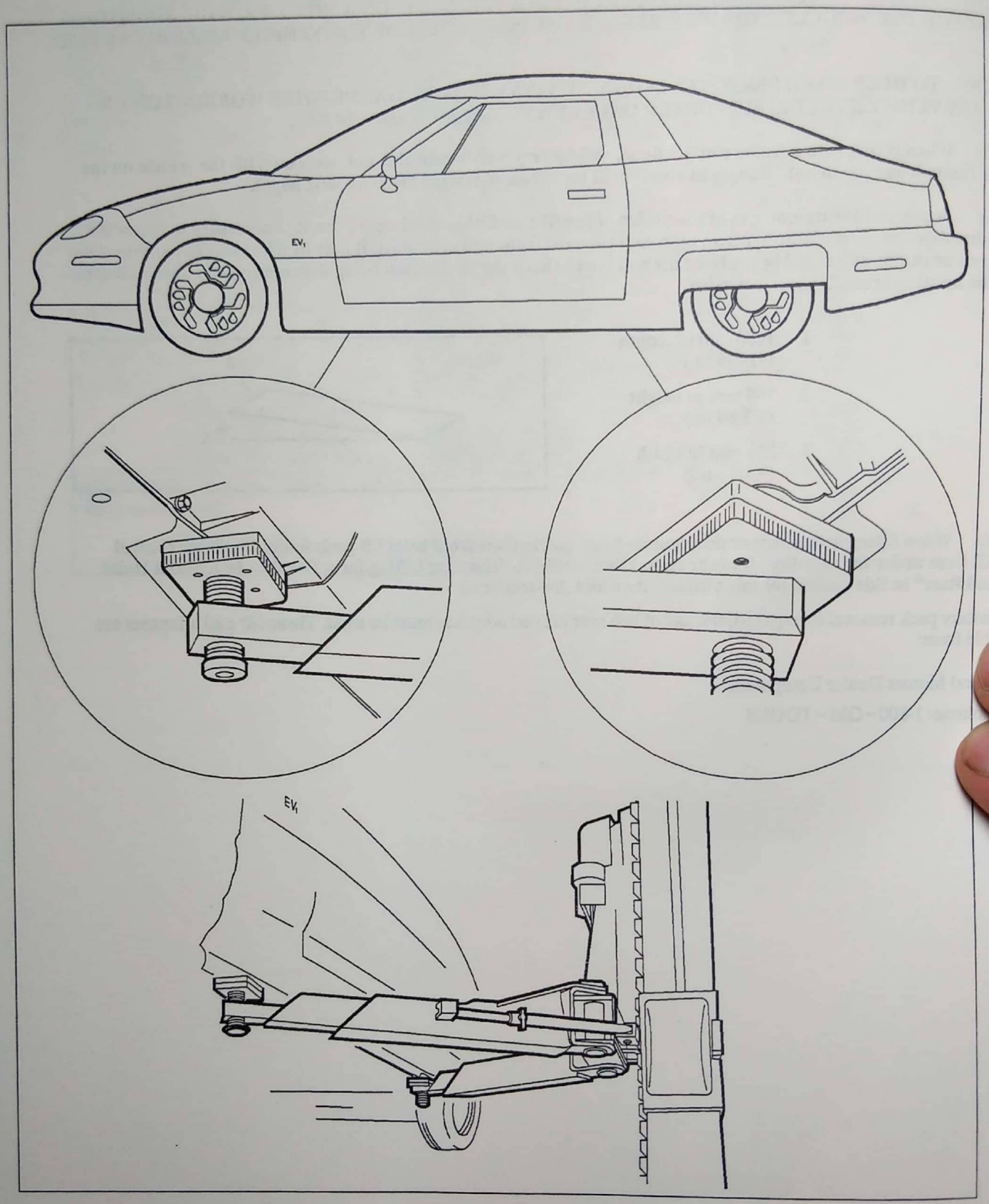
GENERAL INFORMATION



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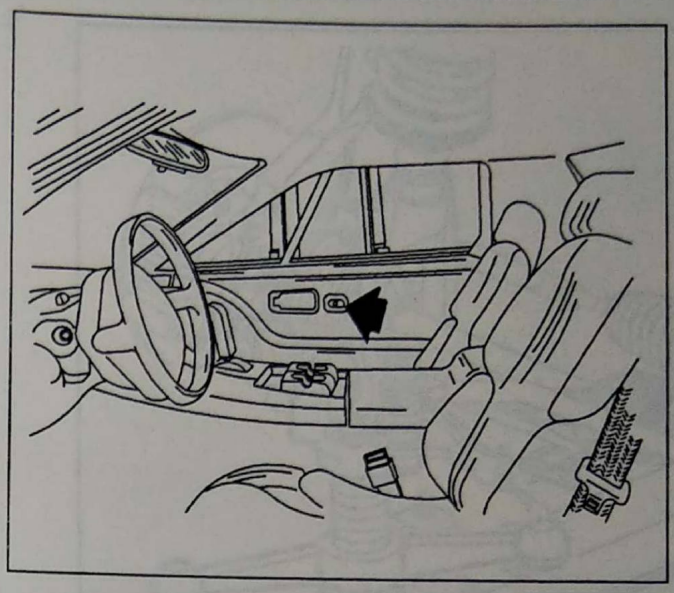
MOISTING/LIFTING FOR A 2 POST *BOVE GROUND HOIST - (SIDE CAR)

mTION: TO HELP AVOID PERSONAL INJURY ‘i WAYS USE JACK STANDS WHEN WORKING ON HR UNDER ANY VEHICLE THAT IS LIFTED ONLY pY A FLOOR JACK OR A HOIST.

TAUTION: **BEFORE ENTERING THE AREA UNDER A RAISED VEHICLE ALWAYS CHECK TO MARE SURE HOIST SAFETY MECHANISMS ARE ENGAGED OR LIFT SAFETY STANDS ARE IN** PLACE.

J Position the vehicle in the hoisting area centering the vehicle between the towers. To center the vehicle to the hoist in its fore aft position, use the door lock switch on the door trim pad as a reference.



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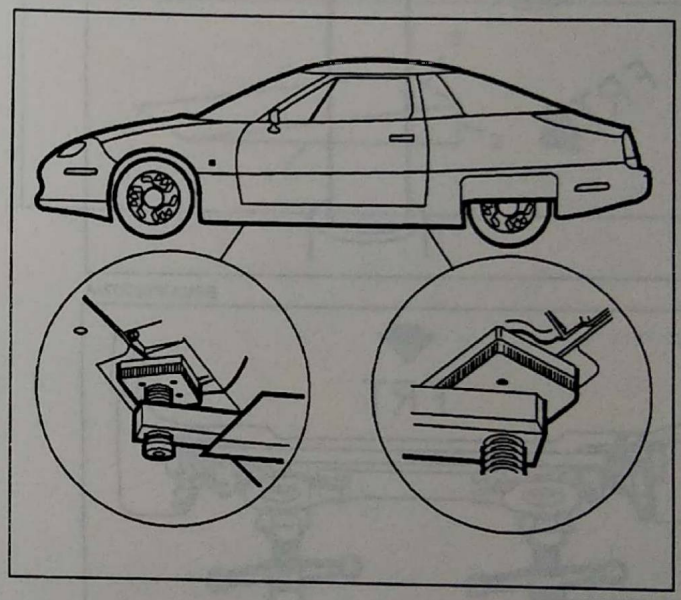
2. Move lift arms under the vehicle and adjust the pads to the bottom of the pinch weld flange at specified lift locations.



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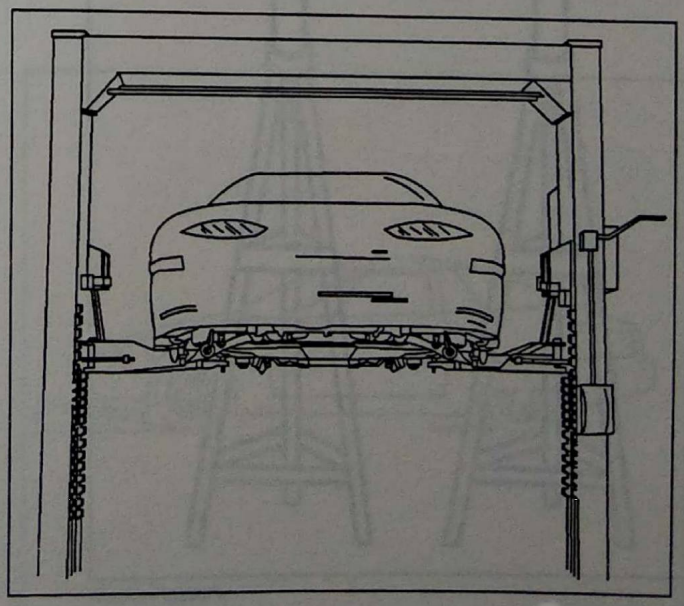
3- Raise the vehicle to the required working height



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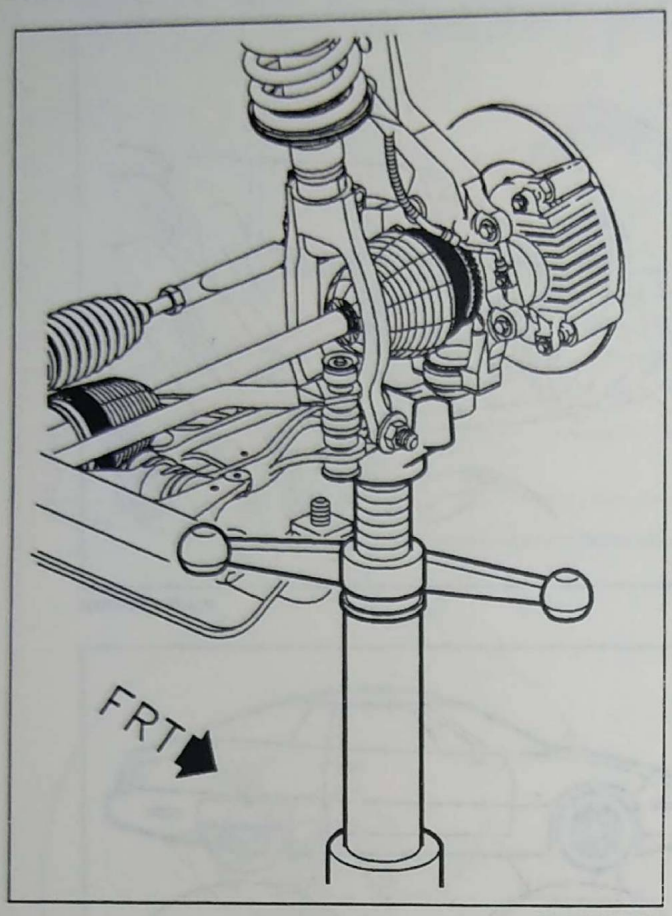
4. Position safety stands in place.



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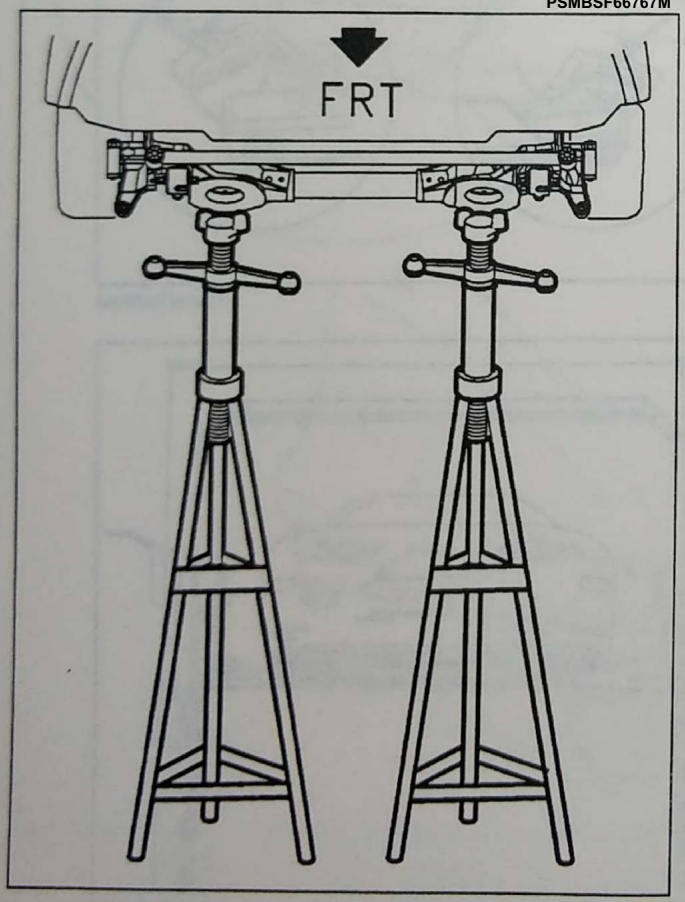

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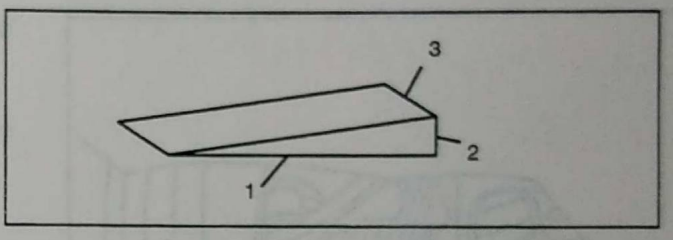
HOISTING/LIFTING FOR A 2 POST INGROUND HOIST - (FRONT AND REAR)

CUTTO' BEFORE ENTERING THE AREA rx'PER 4 RAISED \THICLE ALWAYS CHECK TO M4KF SI RE HOIST SAFETY MECHANISMS ARE F\GAGFD OR HET SAFETY STANDS ARE IN ri^cE.

\OTICF When using an in ground hoist it is neccs'-ar to pay close attention to the ground clearance 8t the front end of the vehicle. Be careful not to damage aTn of the front end components.

N OTICE: Tb< aid of a ramp for some models of lifts is helpful for obtaining clearance under the front end of the vehicle. Proper clearance will keep the fascia and underbod' components from being damaged when approaching or leaving the hoisting area. Ramp size needed:

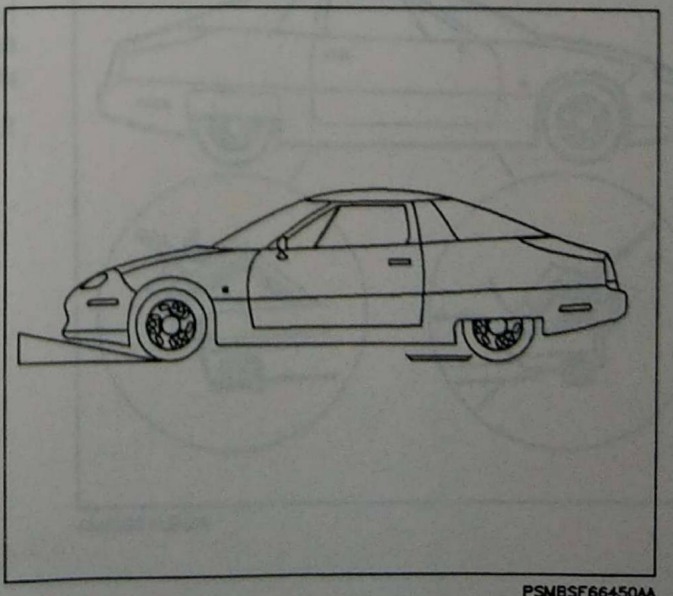
1. 1050 mm in length (41-3/8 in.)
2. 155 mm in vid th (6-7/64 in.)
3. 230 mm in height (9-1/16 in.)



NOTICE: With the use of ramps, always have a partner who will be outside and in front of the vehicle guide and watch to ensure that proper alignment is achieved to the ramps and hoisting area. Be careful that you don't drive over or slip ofT the edge of the ramps. Failure to do so could result in damage to under body and mechanical components.

NOTICE: The first vehicle to be lifted using the ramp method may take several attempts to get properly aligned to the hoist pads under the front of the body structure. Marking the floor with tape, paint or permanent marker after the ramp position is determined *111 aid in the positioning ramps for future EVl vehicle lifting.

1. Drive the vehicle up to the hoisting area, centering the vehicle to the hoist in its side to side position.
2. Drive vehicle forward until the front of the rear tires contact the rear edge of the rear lire lift tray.
3. Place the ramps on the floor. In front of the vehicle, center each ramp in front of the front tires.
4. Slide ramps rearward until they touch the front of !he front tires, or align ramps to markings on floor ^ade from previous lifting as described in the above "NOTICE."



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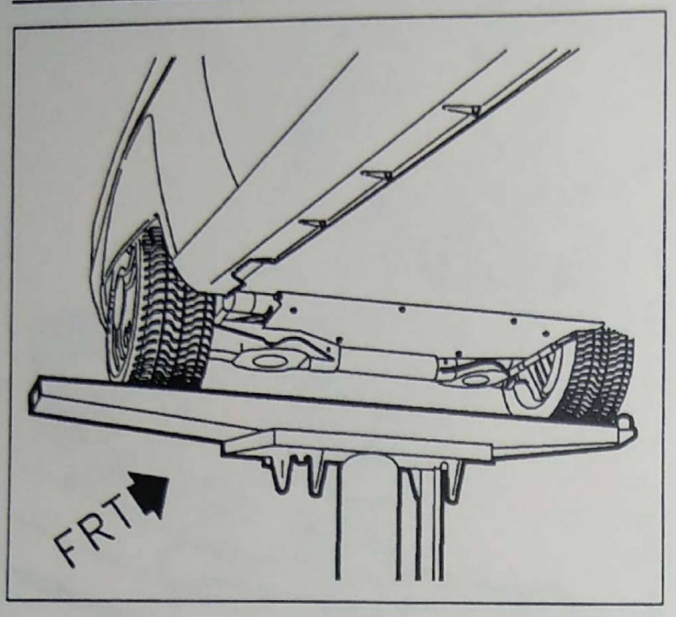

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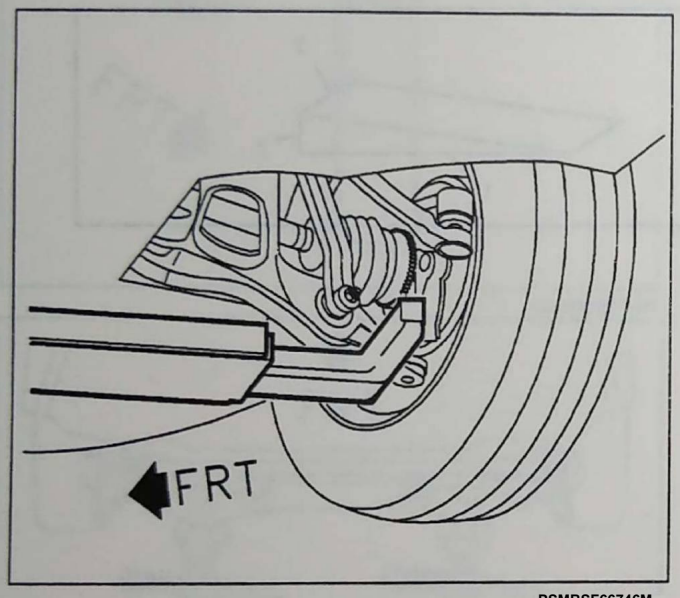
5. Drive forward and up the ramps until the rear tires are centered in the rear tire tray portion of the hoist.



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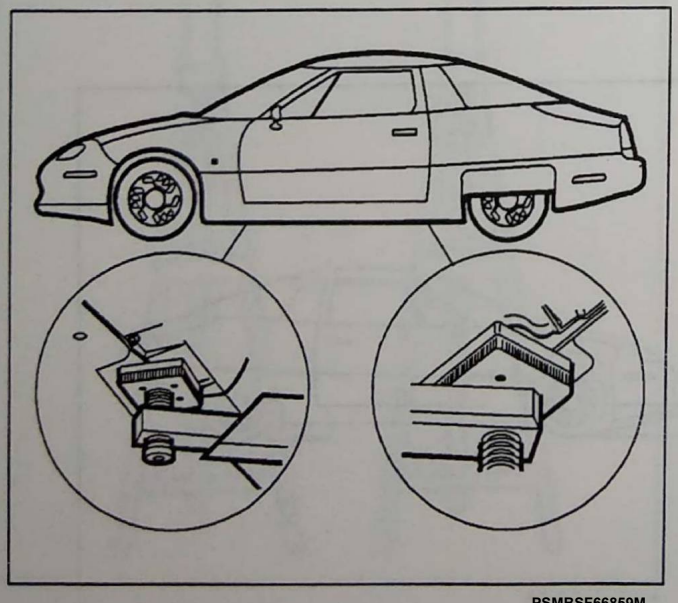
6. Put the front lift pads under the vehicle's front lower control arms at the portion between the ball joint and the yoke.

7. Lift the vehicle to proper working height and position safety stands. (Refer to "Lifting, Jacking, and Support Points" and "Hoisting Lifting with a Floor Jack" sections in this section.)



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LIFTING WITH A FLOOR JACK

NOTICE: Do not put floor jack under any portion of the vehicle other than locations shown or damage to the structure may occur.

1. Locate the rocker panel pinch weld flange lift/hoist areas, place floor jack in position, seat the lift pad in place, and chock the wheels. (Refer to "General Information" in the "Lifting, Jacking, and Support Points" section in this section.)

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ION:

cAL T<S USE JACK STANDS WHEN WORKING ON

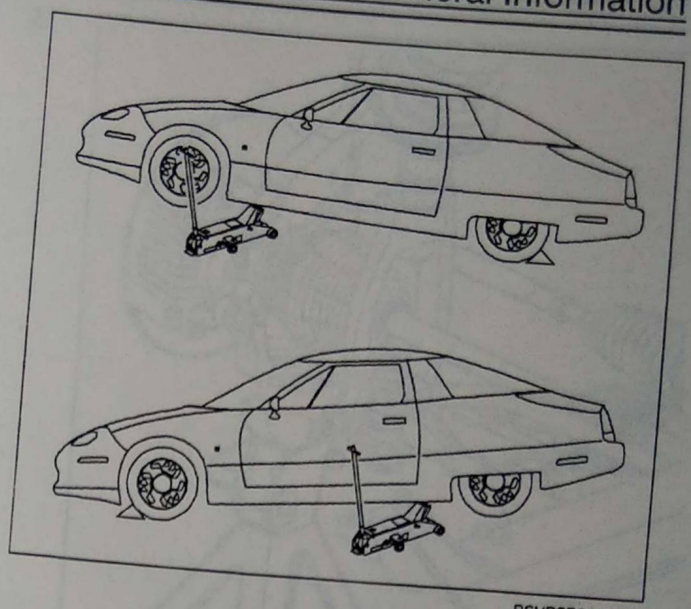
TO HELP AVOID PERSONAL INJURY,

^SnER ANY VEHICLE THAT IS LIFTED BY A

a ^SACKORAHO.ST.

F, anvehidewithnoori -t

2. Lift vehicle with floor jack.



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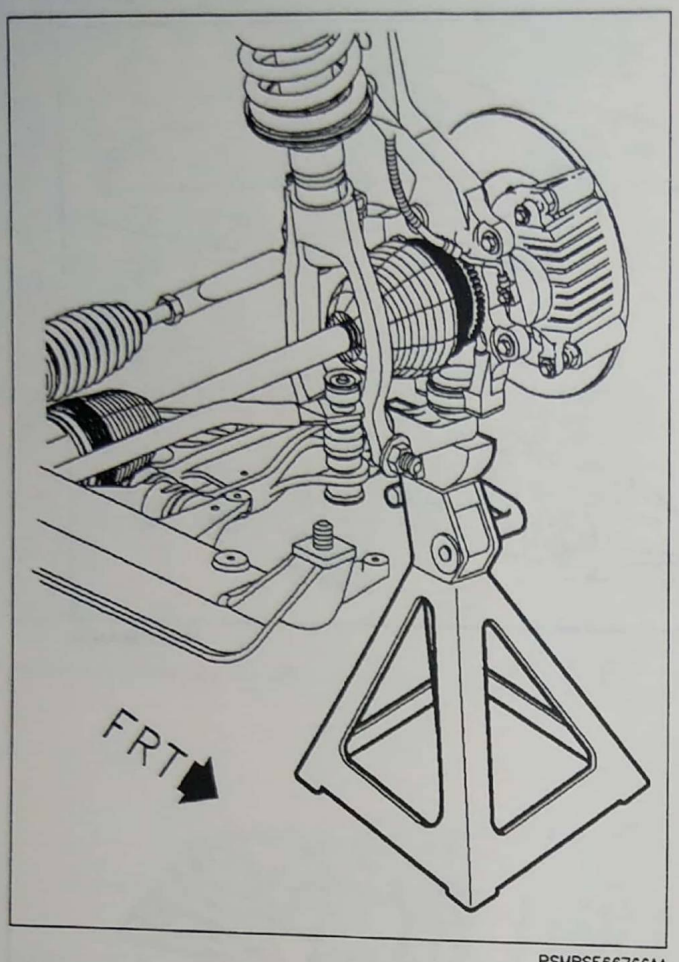

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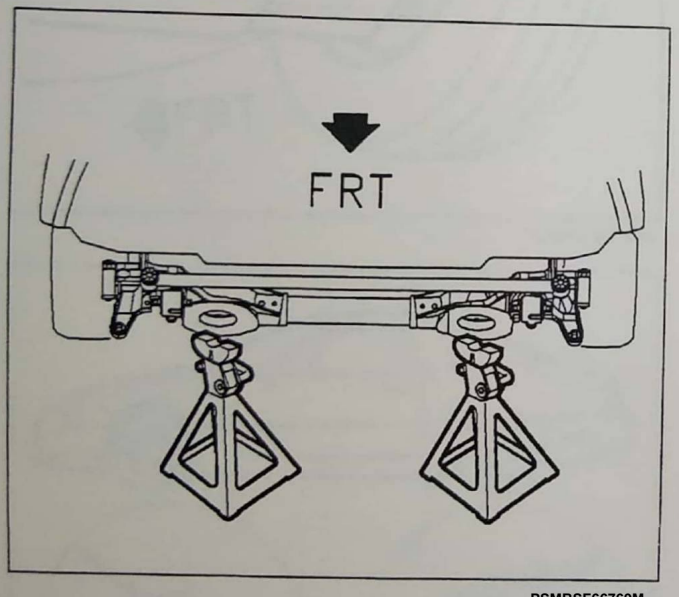
3. Once the vehicle is at the required work' install safety stands. ln§ height



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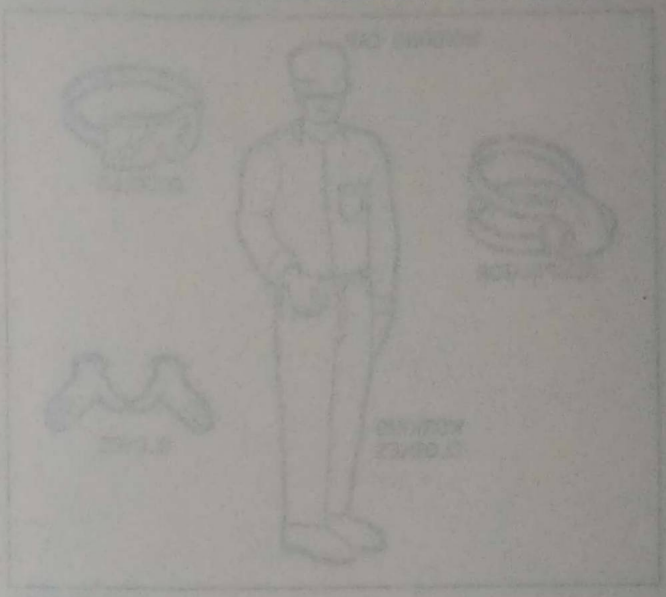

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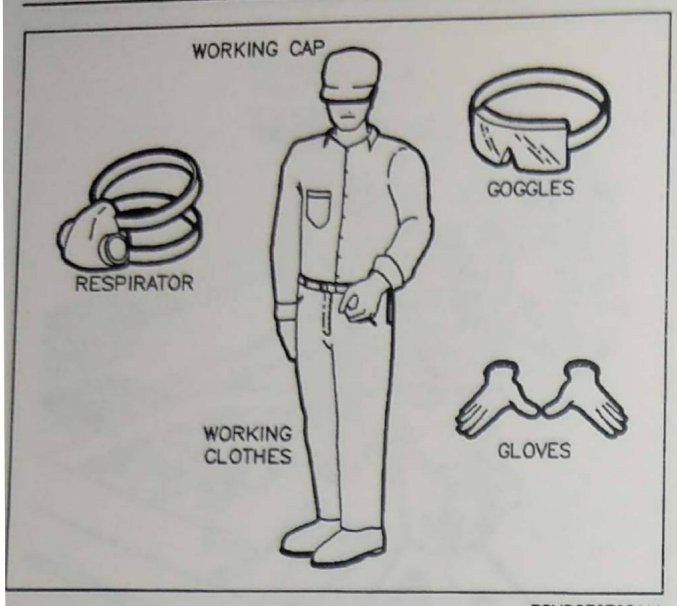

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STATIONARY GLASS

CAUTION: WHEN USING TOOLS THAT MAY CREATE SMOKE WHEN CUTTING URETHANE ADHESIVE, WORK SHOULD BE DONE IN A WELL VENTILATED AREA AND/OR WITH A NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR TO PREVENT POSSIBLE HARMFUL EXPOSURE.

CAUTION: WHEN THE URETHANE ADHESIVE IS HEATED ENOUGH TO GIVE OFF SMOKE, HIGH LEVELS OF METHYLENE DIISOCYANATE (MDI) MAYBE PRESENT.

CAUTION: UNPROTECTED EXPOSURE TO METHYLENE DIISOCYANATE (MDI) MAY RESULT IN SEVERE, CHRONIC, DEBILITATING RESPIRATORY PROBLEMS.

CAUTION: WHEN REPLACING A WINDSHIELD, BACKGLASS, A URETHANE ADHESIVE (PART NO. 12346284) MUST BE USED TO MAINTAIN ORIGINAL INSTALLATION INTEGRITY. FAILURE TO USE URETHANE ADHESIVE WILL RESULT IN POOR RETENTION OF THE WINDSHIELD WHICH MAY ALLOW UNRESTRAINED OCCUPANT TO BE EJECTED FROM THE VEHICLE WITH RESULTING PERSONAL INJURY.

STATIONARY GLASS ADHESIVES

Two types of adhesives are used for stationary glass installation. One-part adhesives, which are moisture curing, usually cure faster in warmer temperatures and higher humidity. These adhesives cure from the outside in.

CURE TIMES

Adhesive cure time refers to the amount of time it takes the adhesive to solidify. It is affected by temperature and bead size. Most one—part adhesives are also affected by moisture.

Driveaway cure time is the amount of time before the vehicle can be driven with little chance that the glass will shift and still meet retention requirements. Manufacturer minimum driveaway cure time, if specified, is based on results achieved in a controlled environment of 75° F (24° C) and 50% relative humidity. Any variance from this temperature during installation will either increase or decrease the minimum driveaway time.

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Ultimate cure lune is the amount of time , it ta adhesive to reach full strength. Fully cured, rul'' f°r an adhesh'e is not stocky to the touch and has.h. thane A consistency of tire rubber. Like minimum drit V time, ultimate cure time is based on result. u' Way CUre w controlled environment of 75° F *(24°* ry ach,cv ed in a relative humidity. Any variance from this te 30% during installation will either increase ora mperatu re ultimate cure time of the adhesive.UnM GCc[ease the specified by the adhesive manufacturer , SS °lhenv>se adhesives should be allowed to cure nat ti dshlc.d

ADHESIVE SERVICE KIT

Adhesive Kit No. 12346284 (urethane adhesive) or equivalent contains some of the items needed to replace a urethane adhesive installed glass.

Additional items required:

- Isopropyl alcohol for cleaning edge of glass and bonding surfaces.
- Cartridge type caulking gun.
- » Commercial type razor knife (for cutting and trimming urethane).
- Power glass removal tool.
- Piano wire and handles.
- Cold Knife
- Tongue Depressor or similar flat flexible tool.

GENERAL INFORMATION

A. Rear glass upper reveal molding*.

1. Roof
2. Molding, upper reveal
3. Rear window

A Rear window frame

B. Quarter panel area of glass:

1- Rear window

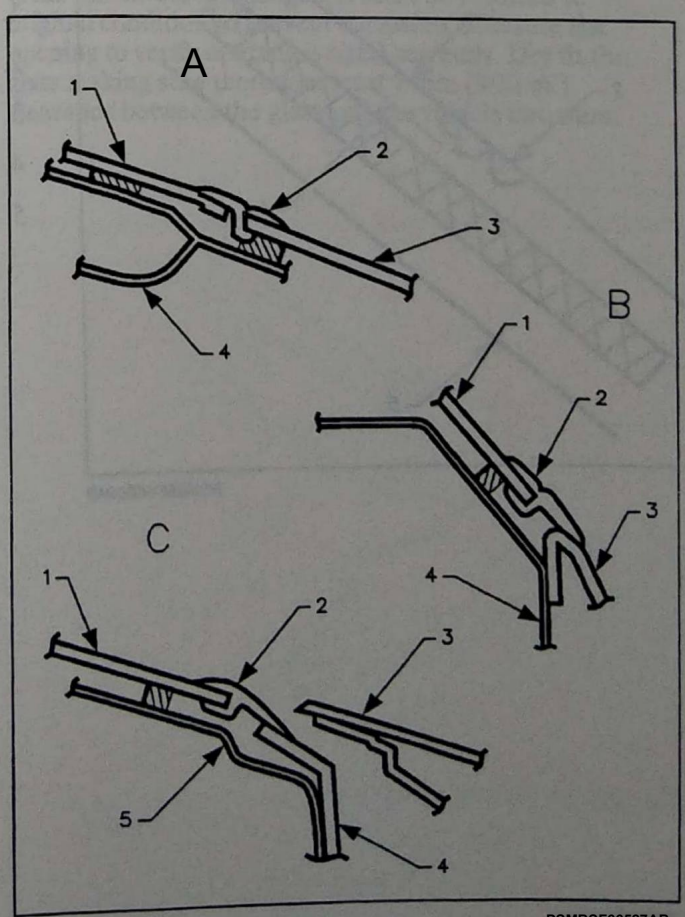
2. Molding lower reveal

3- Quarter panel

4. Rear window opening body panel

C. Decklid area of glass:

1. Rear window
2. Molding lower reveal
3. Decklid
4. Rear window drain panel
5. Rear window body opening panel



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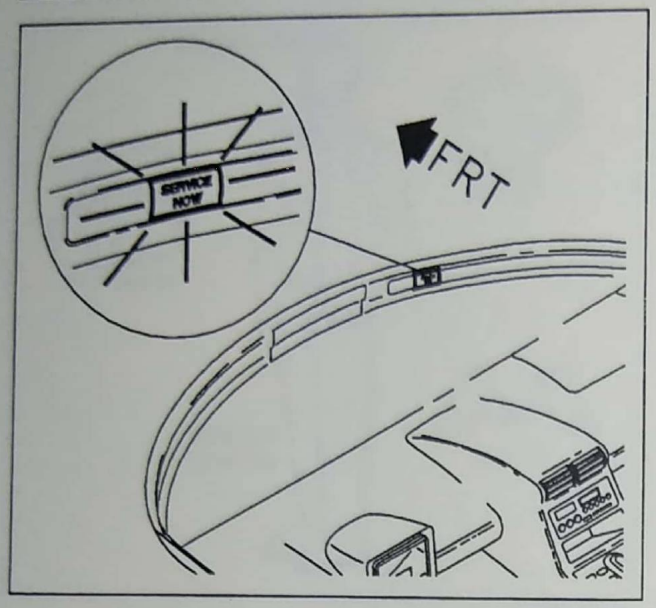

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WINDSHIELD

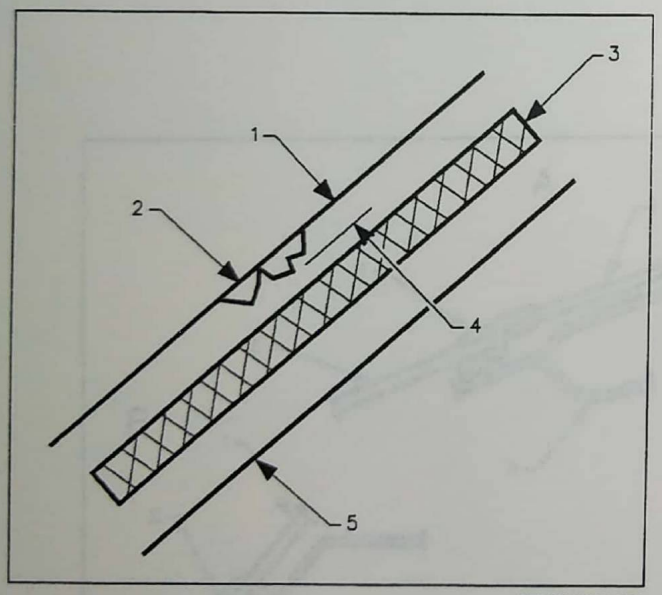
GENERAL INFORMATION

If the front windshield is chipped or cracked, it may prevent proper operation of the heating element in the windshield. In many cases, this condition will cause a "SERVICE NOW" light to illuminate and the vehicle should be brought in for service.

In some cases, a crack or chip in the windshield may not cause the "SERVICE NOW" light to illuminate. However, the heating element may not function properly. In all cases, a cracked windshield should be replaced. In the event that the glass has been chipped, the glass should be replaced if the chip has a depth greater than 1.5 mm (3/64 in.).

Cracks or chips in the glass may cause any of the following conditions:

- The defogging and de-icing functions of the windshield may no longer work.
- The vision of the driver to be obstructed by the chip or crack.
- A local build-up of heat may occur around the crack or chip.



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Pictured is a cut away view of front windshield to help in identifying possible chips or cracks that would require the glass to be replaced.

1. Outer glass layer
2. Chip
3. Laminate
4. Chip depth (1.5 mm [3/64 in.])
5. Inner glass layer

HEATED WINDSHIELD AND BACK GLASS

I DEFOG *AND DE-ICE*

* Both the windshield and the back glass can be Hectncally heated to clear them of fog, frost> snow or ice.

If the windshield is ever chipped or cracked, the -PEFOC- and "DE-ICE" modes may not work proper))'. In some cases, a chip or crack in the windshield will not cause the "SERVICE SOOM» •• t0 rum on even though the "DEFOG" and "DP T® modes aren t working properly. U*>ICE

CAUTION: SOME AREAS OF WINDSHIELD MAV GET VERY HOT WHEN THE "DEFOG" OR -DE ICE" MODE IS TURNED ON. TOUCHING ONF OF THESE AREAS CAN CAUSE BURNS. DON'T TOUCH A CRACKED WINDSHIELD IF THE TEFOG" OR "DE-ICE" MODE IS TURNED ON HAVE THE WINDSHIELD REPLACED AT AN AUTHORIZED SERVICE FACILITY.

NOTICE: The "DEFOG" and "DE-ICE" modes may not work properly if the windshield is chipped or cracked. Any time a chip or crack is noticed in the windshield, have the vehicle serviced at an authorized senice facility;

WINDSHIELD DEFOG: This system will defog the windshield on cold, humid days. It will heat the windshield for five minutes, then it will cycle off and on to keep the windshield clear of fog. If the "Recirculate" mode is selected, the system will switch to "Fresh Air" while defogging the windshield. The system can be burned on and off at any time by selecting the "DEFOG" button located on the run/lock shifter assembly (RSA). For best driving range, turn off defog when it is no longer needed.

WINDSHIELD DE-ICE: This system is used to clear the windshield of frost, snow or ice. It will heat the windshield for 10 minutes, then it will automatically shut off. If the "Recirculate" mode was selected, the system will switch to "Fresh Air" while de-icing the windshield. The system can be turned off at any time by selecting the "DE-ICE" button on the (RSA).

REAR DEFOG/DE-ICE: This system is used to clear the rear window of fog, frost, snow or ice. It will heat the rear window for 10 minutes, then it will automatically shut off. The system can be turned off at any time by selecting the "REAR DEFOGGER" button on the (RSA).

Don't attach anything across the warming grid on the rear window.

NOTICE: Scraping the inside of your rear window could cut and damage the defogger grids.

CHECKING WINDSHIELD OPENING

If an EVi is involved in a collision and the windshield opening needs to be straightened, it is important to restore the opening to the correct size. If either window opening is slightly twisted, a built-in stress point may result and cause the glass to crack when the vehicle is driven.

If the pinchweld is damaged, it must be restored to original condition to prevent corrosion. Measure the opening to verify opening is sized correctly. Dry fit the glass making sure there is at least 7 mm (9/32 in.) clearance between the glass and the vehicle structure.

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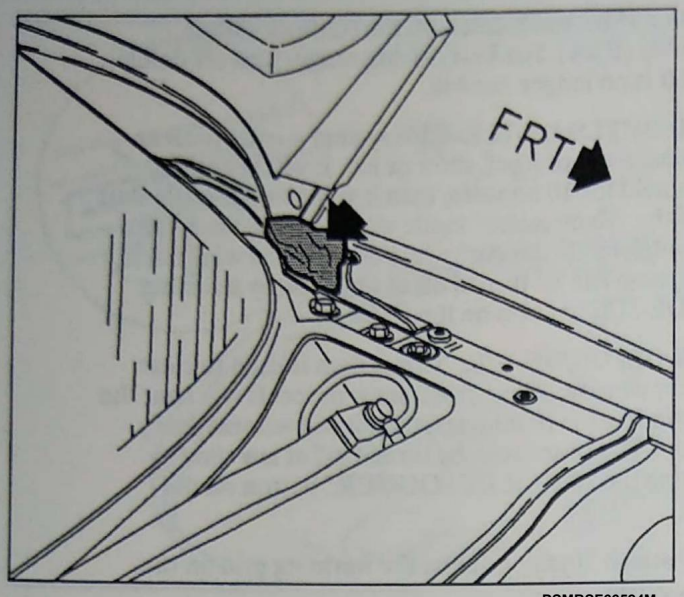

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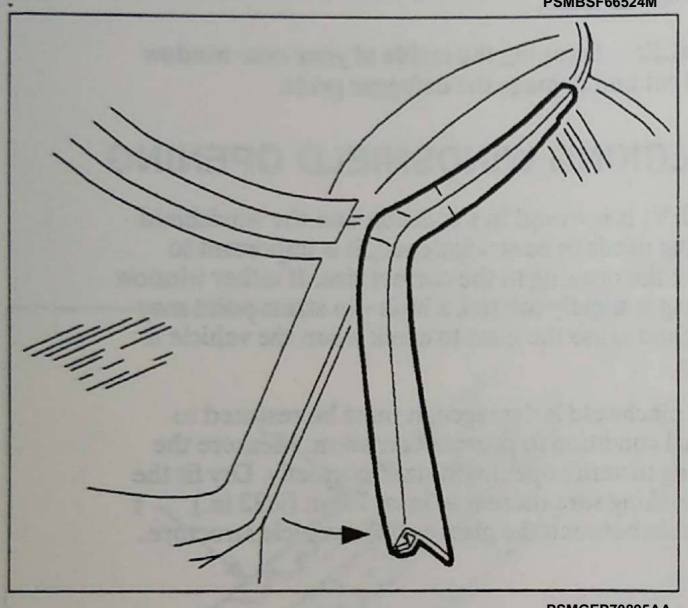

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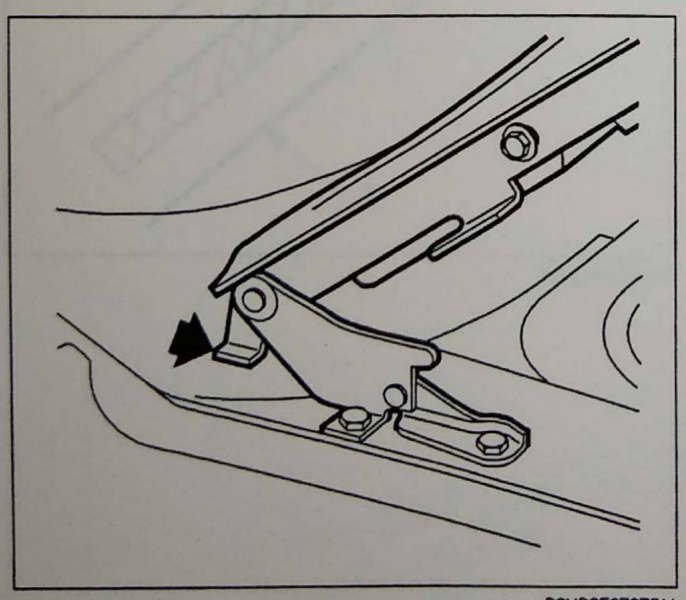

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WINDSHIELD

REMOVAL

CAUTION: ALWAYS WEAR HEAVY GLOVES AND SAFETY GLASSES WHEN HANDLING GLASS TO MINIMIZE THE RISK OF INJURY

NOTICE: If glass removal will be performed with the hood intact place wrap, cardboard, and tape over the hinge areas that are in the path of the glass lower edge. This will help minimize the risk of breaking, cracking, or chipping the glass during removal and installation.

NOTICE: Place protective covers on body and interior of the vehicle to prevent damage.

1. Remove hood panel. (Refer to “Hood Removal” procedure in this service manual.)
2. Remove wiper arm assemblies. (Refer to “Front Wiper Washer” section in this manual.)
3. Remove air inlet screen. (Refer to “Wiper System” section in this manual.)
4. Remove rearview mirror. Disconnect wire for lights on Rearview mirror. (Refer to “Rearview Mirror Removal” section in this manual.)
5. Remove upper reveal molding.
6. Open doors and remove the windshield side reveal moldings from the bottom up to the area of the roof panel.
7. Remove the windshield garnish interior trim panels. (Refer to “Windshield Garnish Molding” in this manual.)

NOTICE: Step (8) is not necessary if the hood has been removed.

8. Position the hood at an angle as to put the hinge stop tab in a vertical position. This will enable the windshield clearance to be removed without removing the hood.

NOTICE: Care must be taken to protect the hood and roof panel from damage while using glass removal tools when removal and installation of glass is done.

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NOTICE: When reusing and installing glass, care must be taken when cutting near the bottom edge of the glass to avoid damage to the electric wires that supply power to the windshield. To disconnect the wire harness, simply pull it off its connector on the back of the power electronics bay. Pull the wire harness through the plenum and tape it to the outer surface of the windshield. DO NOT DISCONNECT THE WIRE HARNESS AT THE LOWER GLASS EDGE!

9. Disconnect plug on back of the power electronics bay that supplies power to windshield.

CAUTION: ALWAYS WEAR HEAVY GLOVES AND SAFETY GLASSES WHEN HANDLING GLASS TO MINIMIZE THE RISK OF INJURY.

CAUTION: WHEN USING TOOLS THAT MAY CREATE SMOKE WHEN CUTTING URETHANE SEALANT WORK SHOULD BE DONE IN A WELL VENTILATED AREA AND/OR WITH A NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR TO PREVENT POSSIBLE HARMFUL EXPOSURE.

CAUTION: WHEN THE URETHANE ADHESIVE IS HEATED ENOUGH TO GIVE OFF SMOKE, HIGH LEVELS OF METHYLENE DIISOCYANATE (MDI) MAYBE PRESENT.

CAUTION: UNPROTECTED EXPOSURE TO METHYLENE DIISOCYANATE (MDI) MAY RESULT IN SEVERE, CHRONIC, DEBILITATING RESPIRATORY PROBLEMS.

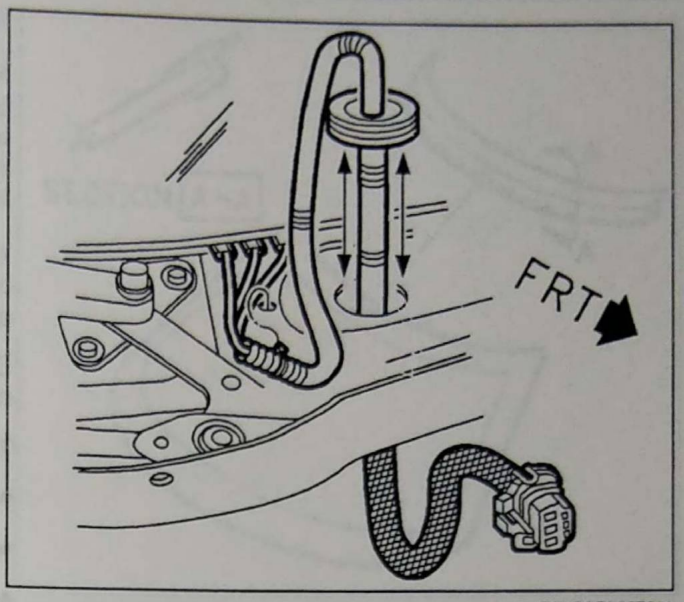
CAUTION: WHEN REPLACING A WINDSHIELD, BACKGLASS, A URETHANE ADHESIVE (PART NO. 12346284) OR EQUIVALENT MUST BE USED TO MAINTAIN ORIGINAL INSTALLATION INTEGRITY. FAILURE TO USE URETHANE ADHESIVE WILL RESULT IN POOR RETENTION OF THE WINDSHIELD WHICH MAY ALLOW UNRESTRAINED OCCUPANT TO BE EJECTED FROM THE VEHICLE WITH RESULTING PERSONAL INJURY.

NOTICE: When cutting from inside of the vehicle the tape wrapped around the blade of a power urethane cutting tool will act as a depth gauge, decreasing the possibility of the blade cutting through the adhesive and damaging the fender panels or roof panel.

10. Using urethane cutting tools, cut the urethane seal along the top, sides and bottom of the glass.

NOTICE: It is helpful if when cutting out the glass, to aid in the process of reinstalling glass, cut the urethane as close to the glass as possible.

11. With the aid of a helper and suction cups, remove the glass.



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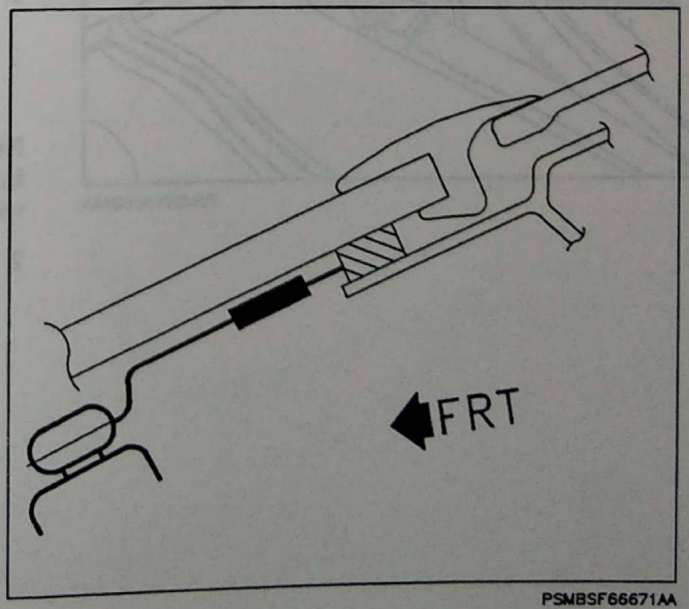

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INSTALLATION

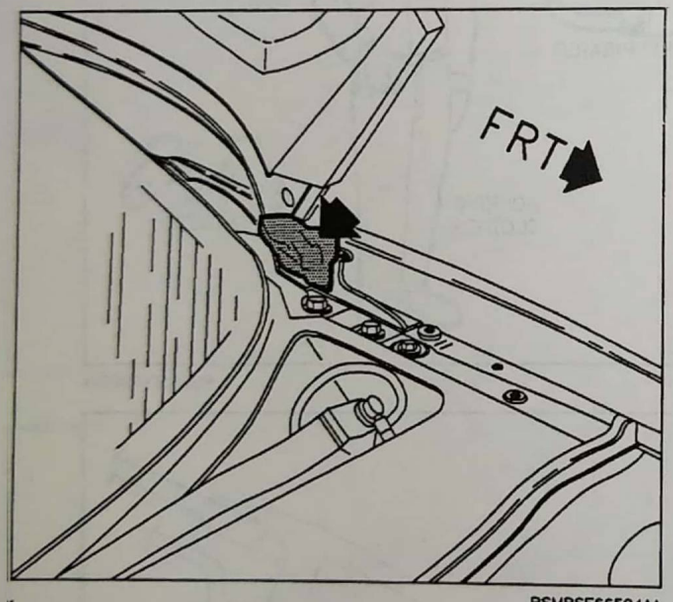
NOTICE: Vehicle must be on level surface during glass installation. If the vehicle is not level, the glass opening may be twisted slightly. This could result in a built-in stress point, cause the glass to crack when the vehicle is driven.

IMPORTANT: There are three primers and a glass prep chemical in the 12346284 kit. #1, #2, and #3 are the only ones used on an EVi glass replacement.

Before using any of the primers glass prep or urethane read directions about kit.

The kit will include:

- 1 tube of U400 urethane adhesive
- 1 container of glass prep #1
- 1 container of glass primer #2
- 1 container of pinchweld primer #3
- 1 container of PVC primer
- 4 application daubers
- 1 instruction sheet
- 1 caulking tube tip



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NOTICE: If hood was left in place during the removal of the windshield, check to make sure that the cardboard and tape that was placed over the hinge areas that are in the path of the glass lower edge are still in place. This will help minimize the risk of breaking cracking or chipping the glass.

NOTICE: Loose urethane and/or a rough surface on remaining urethane may cause sealing problems during or after installation.

1. Using a razor sharp knife, remove any loose urethane, and trim the high spots in the remaining urethane to provide an even application surface for the new material.

NOTICE: Check urethane retention to structure to insure remaining urethane is correctly bonded to windshield opening.

2. If old glass is to be reinstalled, all urethane must be removed from the glass.

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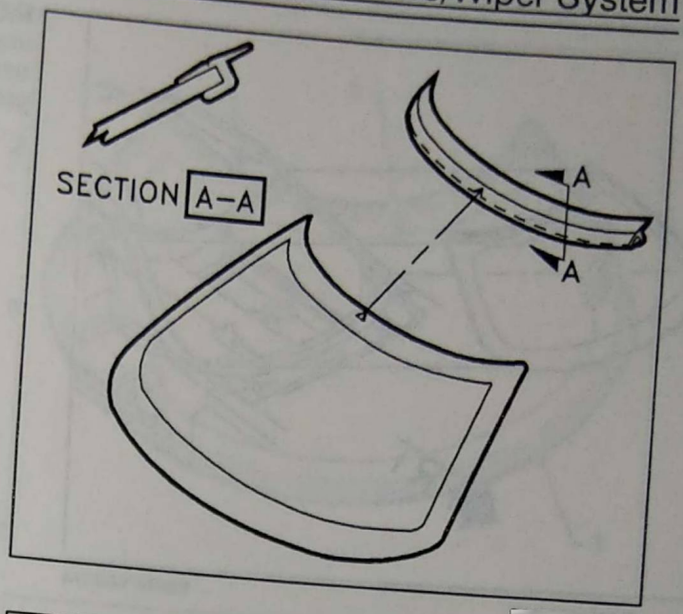
, Clean the *interior surface of* the glass with -> 1 *)int free alcohol dampened cloth 3 clean_

4 *install roof molding on top edge of the windshield Alien notch on lower inner edge of roof J ld- ',1K triangle on the interior side of the* d'ng *to the top/centcr Apply molding* from thfeeme^ at *working toward molding* ends. ler out ,

5. Place front windshield in working area with n jnterior Side of the glass facing up Locate d marks on the interior side *of* the *winSsh eV* ndlcatin g *location position* for windshield lower seal

t>. Remove backing cover from two-sided ta™ • lower seal. taPe °n inner

7. *Apply* the inner lower seal to the ton marks. Start at the end with the VTM i 6 of the dash the lower inner seal.align to dash/d , cut out plate cut out in glass. " ed mar^s and vin



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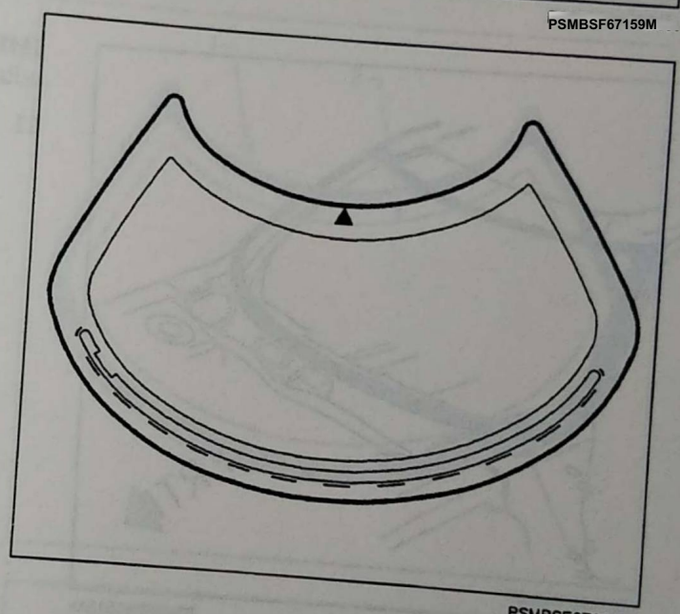
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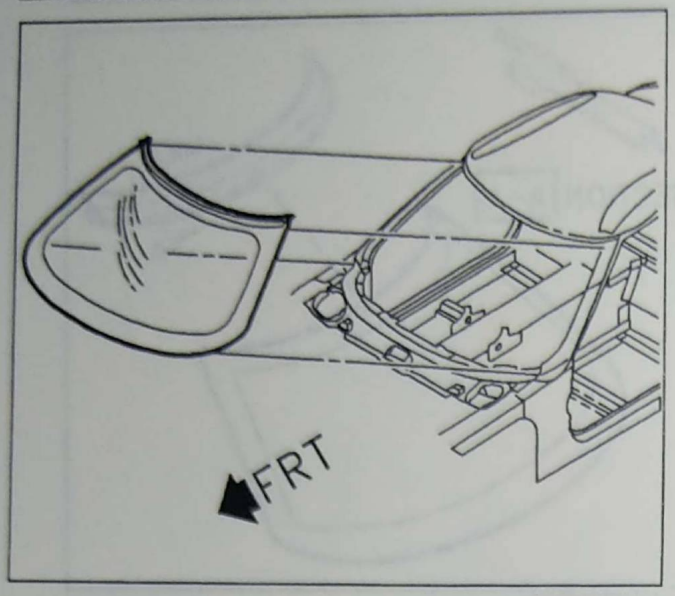

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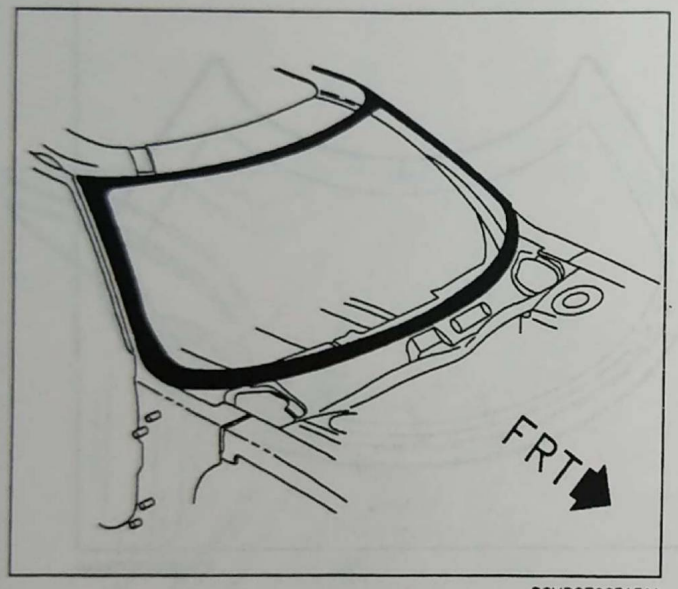

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IMPORTANT: When installing windshield, it is important to set glass in true body position during initial setting of windshield. Do not rock, tip, or slide glass into position.

8. With the aid of a helper, pre-fit the glass to the body opening. This is a good time to practice how to get the glass into position once urethane is finally applied. Fit glass in position, check alignment with roof and upper door frame body lines.
9. Once glass is correctly located, apply tape two pieces of masking tape over the edge of the glass onto the roof panel approximately 400 mm (16 in.) on each side of the center line. Slit tape at edge of glass molding. During installation, tape on glass can be aligned with tape on body to guide glass to desired position. Remove glass.
10. Clean body windshield opening and inner side windshield with a clean, lint free, alcohol dampened cloth.

IMPORTANT: Do not prime over any existing urethane adhesive.

11. If there is any bare aluminum exposed in the window opening, reprime these areas with pinchweld primer #3 from kit 12346284. Follow manufacturer's recommendation for drying time.

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TANT* For old/same glass installation, remove ivc from glass before priming with clear and all 3 dbe TS.
Slack Pon,e

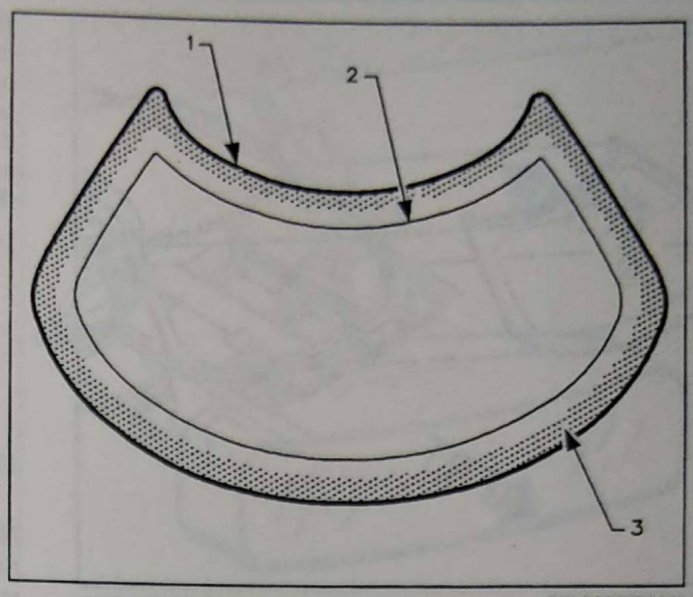
The glass prep or primers should not extend beyond t nc * 2C o f the windshield black out.

i kc glass prep from k,t # 12346284 and apply it j n locations of primers and urethane adhesive as shown.

j Windshield

o Bdce of black out

3 Glass prep #1 from kit #12346284



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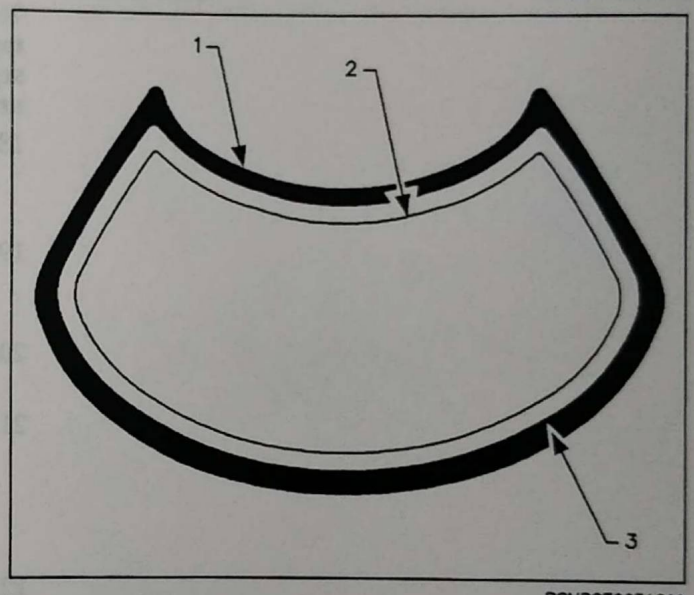
13. Use glass primer #2 from kit #12346284 and apply it in the area for of primers and adhesives as shown

1 Windshield edge

2 Edge of black out

3 Glass primer #2 from kit # 12346284



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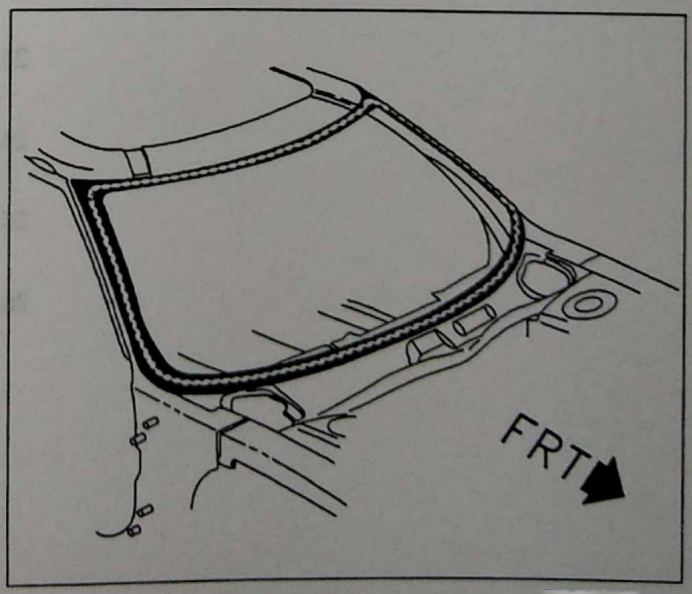
14. Apply a smooth continuous bead of adhesive on top of the old adhesive in the body opening for the glass.

15. With the aid of a helper and suction cups. Lift glass In Lo window opening. Align tape on glass assembly to tape on body.



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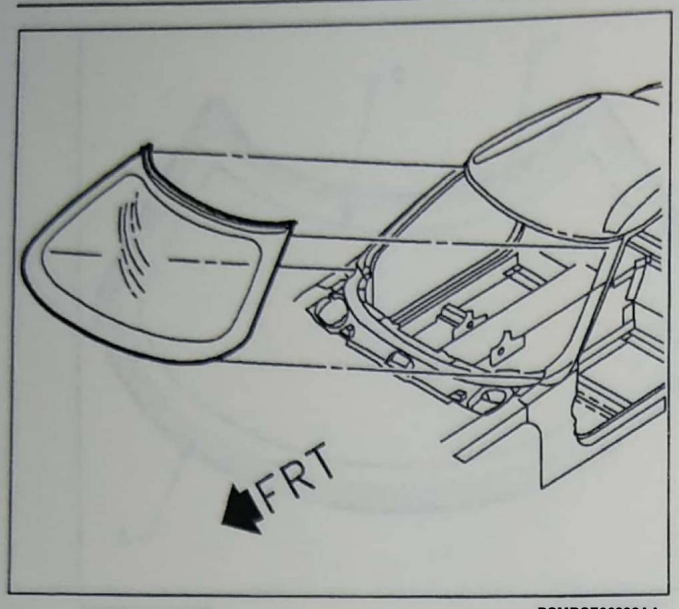

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IMPORTANT When installing the glass with hood panel in place it is important to place the glass into the body opening to simulate true body position. Put the glass in by lifting the bottom edge of the glass under the rear of the hood first to gain clearance under the rear of the hood True body position installation is important even if the hood panel is removed.

16. Press glass firmly to wet-out and set adhesive. Upper windshield reveal molding should be contacting roof panel along full length of molding. Use care to avoid excessive squeeze out which would cause an appearance problem. Use tape to hold the glass in its proper position against the front edge of the roof panel.
17. Install windshield side reveal moldings, being careful not to shift glass during molding installation.

NOTICE: Until the new urethane has cured, air pressure from a closing door may cause the windshield to move. To prevent this, lower the windows a minimum of 76mm (3 in.) before closing the door. Water applied on top of urethane adhesive during water test or as a separate operation, will speed up the cure of the urethane.

18. Water test vehicle at once using a soft spray. Use warm or hot water if available. Do not direct a hard stream of water at fresh adhesive material.
19. Inspect for leaks from inside the vehicle. Paddle in extra adhesive at leak points using a tongue depressor or similar flat flexible tool.
20. Install windshield garnish interior trim panels. (Refer to “Windshield Garnish Molding” in this manual.)
21. Install rearview mirror. Reconnect wire for lights on Rearview mirror. Refer to “Rearview Mirror Removal” section in this manual. If a new rear view mirror support is needed (Refer to “Rear View Mirror Support” section in this service manual.)
22. Install air inlet screen. (Refer to “Wiper System’ section in this manual.)
23. Install wiper arm assemblies. (Refer to “Front Wiper Washer” section in this manual.)
24. Allow adhesive to dry. (Refer to manufacturer’s recommendations.)
25. Remove tape from glass and roof panel. Be sure to remove all traces of the tapes adhesive.
26. Install the rear view mirror support. (Refer to “Rear View Mirror Support” section in this service manual.)

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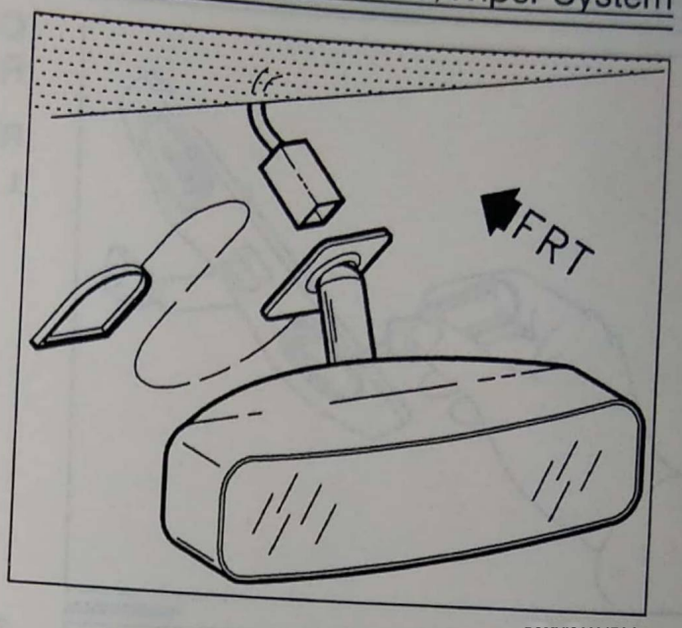
SIDE REAR VIEW MIRROR

REMOVAL

1. Disconnect mirror wire harness connector.
2. Use one hand to support one end of rear view mirror against windshield assembly.
3. Use other hand to pull rear view mirror assembly upward away from mirror support.



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INSTALLATION

1. Position bottom of rear view mirror assembly to top of mirror support.
2. Slide rear view mirror assembly onto mirror support, keeping rear view mirror assembly parallel to windshield assembly.
3. Apply a moderate amount of force to fully seat rear view mirror assembly onto mirror support. A double click will be heard when rear view mirror assembly is fully seated.
4. Connect mirror wire harness connector.

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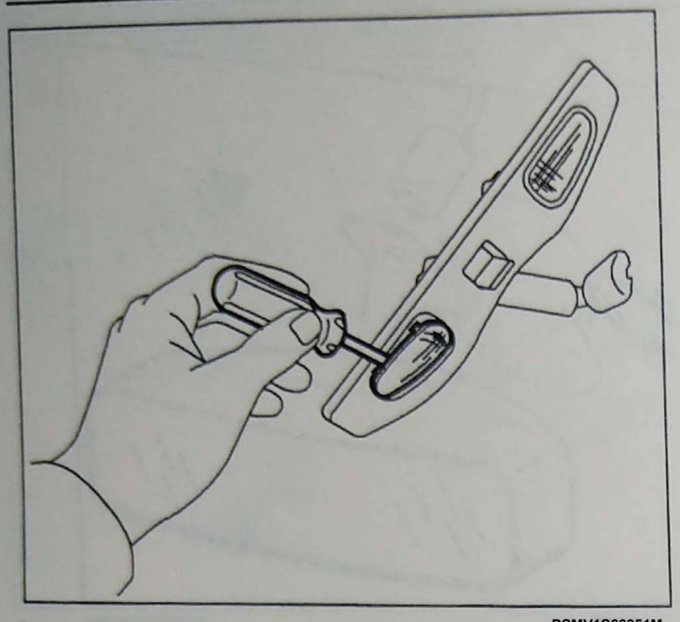

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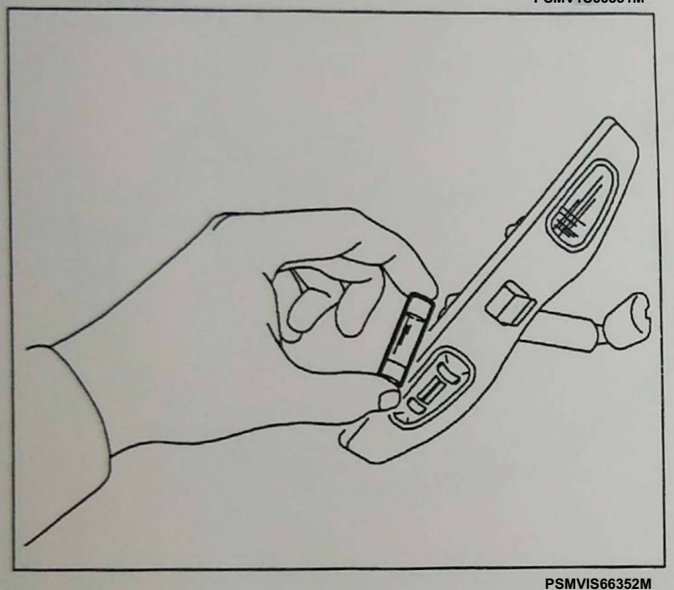

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COURTESY LAMP BULB REPLACEMENT

REMOVAL

1. Using a small screwdriver pry off courtesy lamp i$_{ens}$ assembly.
2. Remove courtesy lamp bulb

INSTALLATION

1. Install courtesy lamp bulb.
2. Install courtesy lamp lens.

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REAR VIEW MIRROR SUPPORT

INSTALLATION

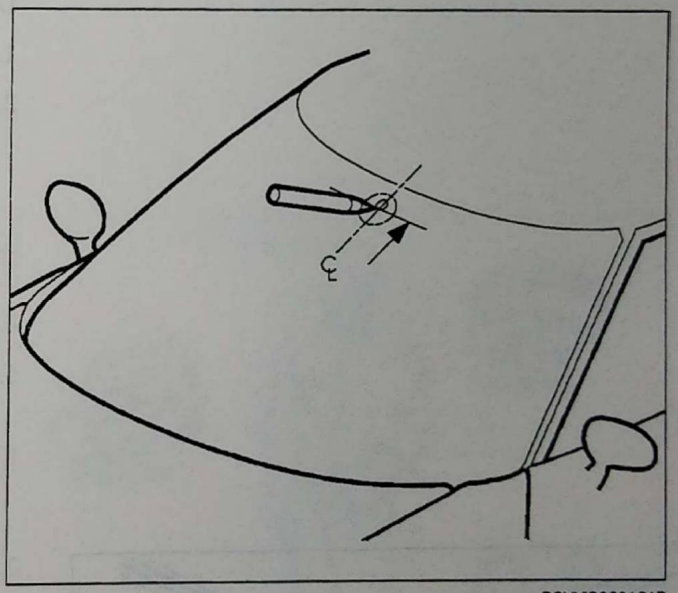
I The rear view mirror is attached to a support which is bonded to the windshield glass. This support is installed by the glass supplier.

Service replacement windshield glass has the mirror support bonded to glass assembly. To install a detached mirror support or install a new part, the following items are needed:

- P/N 11067-2, Loctite® Rear View Mirror Adhesive or equivalent.
- Original mirror support (prepared per step 4 and 5 of Installation procedure) or replacement rear view mirror support.
- Wax marking pencil or crayon.
- Rubbing alcohol.
- Clean paper towel.
- Fine grade emery cloth or sandpaper (No. 320 or No. 360).
- Clean toothpick.

1. To determine rear view mirror support position on windshield, measure from bottom of windshield toward roof line, to bottom (flat side) of mirror support. Support should be 748mm (29 1/4 in.) in the center of windshield.
2. Mark location on outside of glass with wax pencil or crayon. Also make larger diameter circle around the minor support on outside of glass surface.
3. On inside glass surface, clean large circle with paper towel and window cleaning solution or polishing compound. Rub until area is completely clean and dry. When dry, clean area with an alcohol saturated paper towel to remove any traces of window cleaning solution or polishing compound from this area.
4. Separate mirror from support. With a piece of fine grade (No. 320 or No. 360) emery cloth or sandpaper, sand bonding surface of new rear view mirror support or factory installed support. If original rear view mirror support is to be used, all traces of factory installed adhesive must be removed prior to reinstallation.
5. Wipe sanded mirror support with clean paper towel saturated with alcohol and allow to dry.
6. Follow directions on manufacturer's kit to prepare rear view mirror support prior to installation on glass.
7. Properly position support to its marked location, with rounded end pointed upward; press support against glass for 30 to 60 seconds, exerting steady pressure against glass. After five minutes, any excess adhesive may be removed with an alcohol moistened paper towel or glass cleaning solution.

8- Install mirror. (Refer to "Inside Rear View Mirror Installation" procedure in this service manual).



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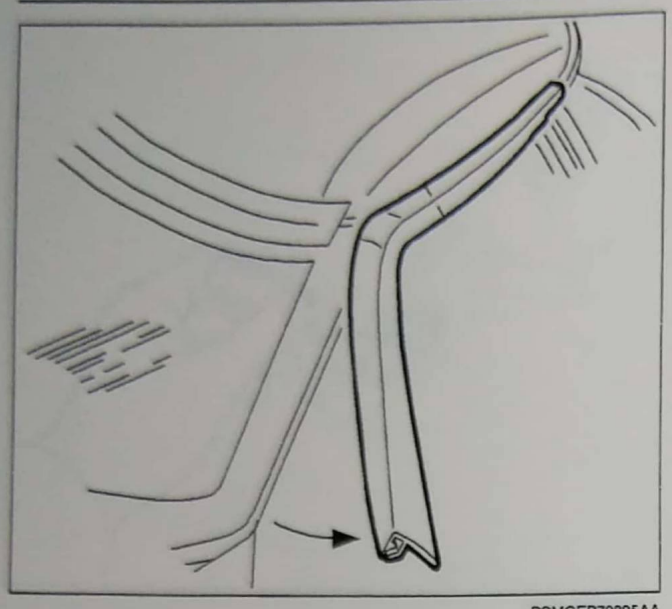

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WINDSHIELD - SIDE REVEAL MOLDING

REMOVAL

1. Remove windshield side reveal molding clip from windshield side reveal molding.
2. Remove windshield molding by pulling carefully from A-pillar and roof panel side rail assembly.

IMPORTANT: In some instances, urethane adhesive may have been used to attach the windshield side reveal molding to the windshield.

3. Remove all traces of adhesive from A-pillar and roof panel side rail assembly with suitable solution of isopropyl alcohol (50/50 mixture by volume with water) or high flash naphtha.
4. Wipe area with clean dry cloth.

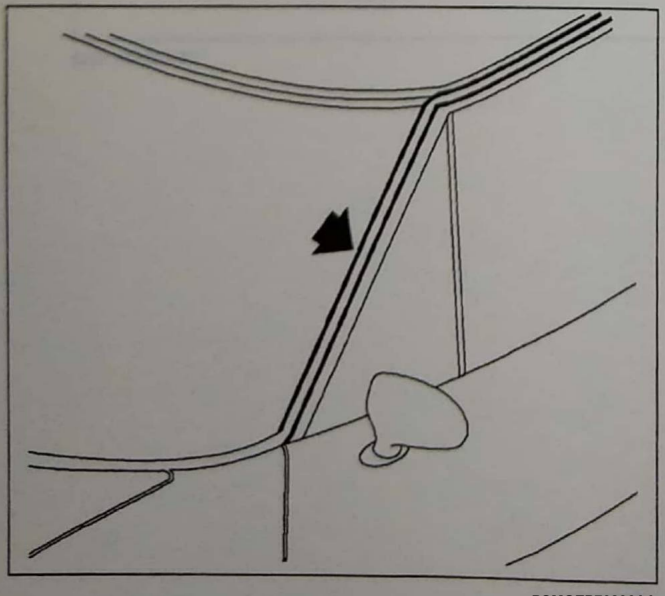
INSTALLATION

IMPORTANT: To ensure adequate retention, always replace windshield side reveal molding with a new part. Do not re-use old part.

1. Wash affected area with soap and water and wipe dry.
2. If vehicle is below 21° C to 32° C (70° F to 90° F) due to shop temperature, warm the A-pillar and roof side rail assembly with a heat gun before proceeding to step 3.
3. Attach roof side leg of molding to roof by inserting tongue of molding into groove in roof panel assembly.
4. Place windshield leg of molding to edge of windshield.
5. Apply masking tape to windshield leg of molding to temporarily secure molding to windshield.
6. Close door and check alignment of windshield side reveal molding to door stationary window package assembly.
7. Adjust windshield reveal molding until it appears equal and parallel to the stationary window package assembly as shown.
8. Mark position of windshield side reveal molding to windshield with masking along edge of molding.
9. Pull adhesive backing tape from windshield leg of molding and attach molding to glass. Press molding firmly in place.

IMPORTANT: A proper seal between the windshield side reveal molding and stationary window package must be maintained to prevent waterleaks or windnoise.

10. Close door and check seal between windshield molding and stationary window package.



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IMPORTANT: The windshield side reveal molding may need an upward or downward movement of the molding along the A—pillar side of the molding to achieve a proper seal at the door.

11. Pull adhesive backing tape from roof side rail and A—pillar side of molding and attach molding to vehicle body. Press molding firmly in place.
12. Roll entire molding to wet-out adhesive along windshield glass, roof panel, and entire door opening.
13. Attach windshield side reveal molding clip to windshield side reveal molding and rear window upper molding.

BACK GLASS

I CHECKING BACK GLASS OPENING

F If an EV-! is involved in a collision and the back glass opening needs to be straightened, it is important to restore the opening to the correct size. If window opening is slightly twisted, a built-in stress point may result and cause the glass to crack when the vehicle is driven.

If the pinchweld is damaged, it must be restored to original condition to prevent corrosion. Measure the opening to verify opening is sized correctly. Dry fit the glass making sure there is at least 7 mm (9/32 in.) clearance between the glass and the vehicle structure.

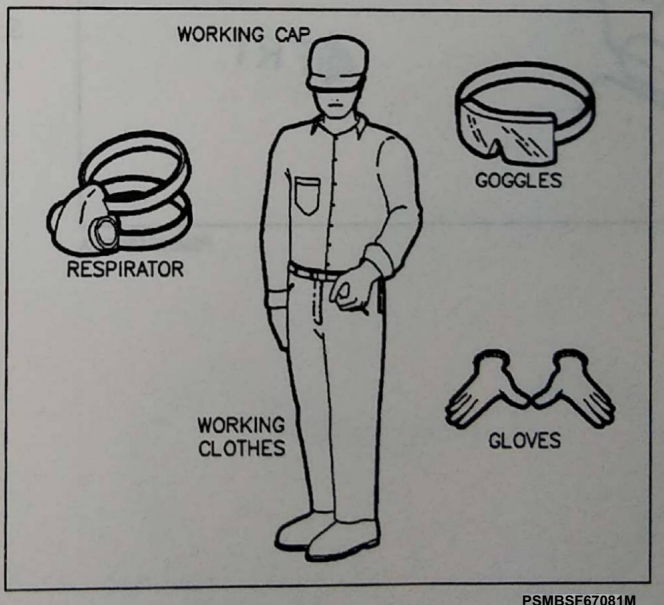
I REMOVAL

CAUTION: ALWAYS WEAR HEAVY GLOVES AND SAFETY GLASSES WHEN HANDLING GLASS TO MINIMIZE THE RISK OF INJURY.

CAUTION: WHEN USING TOOLS THAT MAY CREATE SMOKE WHEN CUTTING URETHANE SEALANT, WORK SHOULD BE DONE IN A WELL VENTILATED AREA AND/OR WITH A NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR TO PREVENT POSSIBLE HARMFUL EXPOSURE.

CAUTION: WHEN THE URETHANE ADHESIVE IS HEATED ENOUGH TO GIVE OFF SMOKE, HIGH LEVELS OF METHYLENE DIISOCYANATE (MDI) MAY BE PRESENT.

CAUTION: UNPROTECTED EXPOSURE TO METHYLENE DUSOCYANATE (MDI) MAY RESULT IN SEVERE, CHRONIC, DEBILITATING RESPIRATORY PROBLEMS.



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NOTICE: Place protective covers on body to prevent paint damage.

IMPORTANT: Be sure to clean up any broken glass.

► I- Remove the left and right upper/outer quarter panels. (Refer to “Upper outer quarter panel removal in the “Body Repair” manual.)

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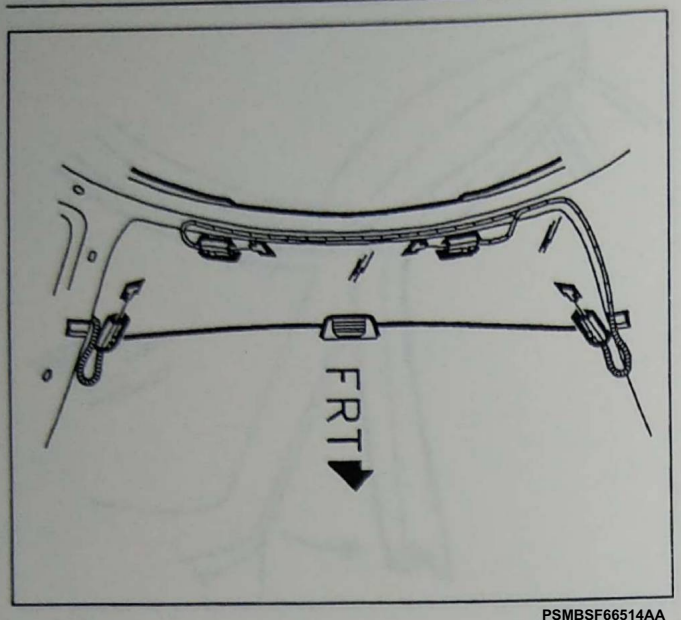

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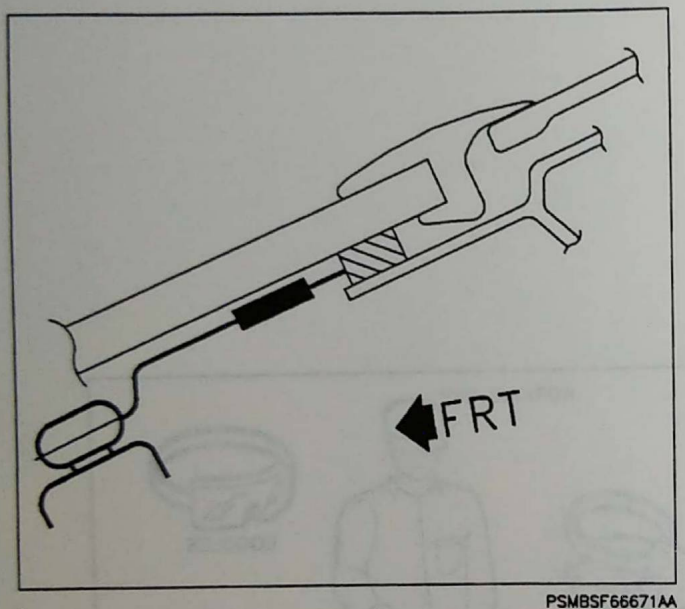

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2 Remove the four electrical connectors from bus bars.

If the glass is not broken:

3 Remove upper and lower back glass moldings.

wnTTCE- Be careful not to damage decklid and quarter nan s during the glass removal process Place heavy ta pe P the decklid forward portion and on the quarter panels °" nc where they meet the back glass. As well as on any other areas that will require this step for protection of the finish.

NOTICE: It is helpful if when cutting out the glass, to cut the urethane as close to the glass as possible. This will aid in the process of reinstalling glass.

4. With a urethane cutting tool, cut the urethane seal along roof sides and bottom of the glass.

NOTICE: When cutting from the inside of a vehicle the use of tape wrapped around the blade of the urethane cutting tool will act as a depth gauge, decreasing the possibility of the blade cutting through the adhesive and damaging the quarter panels or roof panel.

5. If the glass is still in one place, with the aid of a helper lift and remove the glass.

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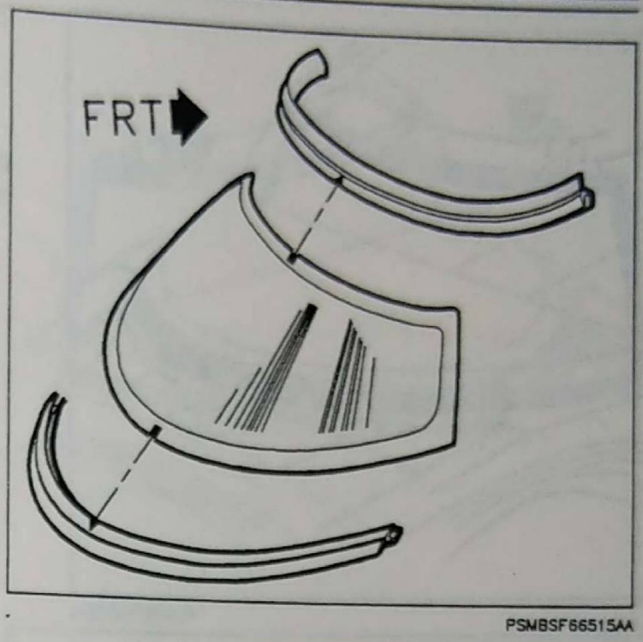
|MS TAL^ON



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NO CE: Vfhick T5? be on "?cl surfa« during gia,, tltion. " th* veh,C L e *.S no< the g lass op n f g. level ing twisted slightly. This could result in a built-in stress rnL and C8"Se ‹hf RlaSS t0 CFack When the chicle i<dri'*n

rUPORTAN^ There are three different primers and a \'I prep chemical in the 12346284 kit. #1. #2. and #3* ■the only ones used on an EVi glass replacement.

Refort using any of the primers glass prep or urethane read and understand all directions about kit.

phe kit will include:

- *1* tube of U400 urethane adhesive
- 1 container of glass prep #1
- 1 container of glass primer #2
- 1 container of pinchweld primer #3
- 1 container of PVC primer
- 4 application daubers
- 1 instruction sheet
- 1 caulking tube tip

NOTICE: Loose urethane and/or a rough surface on remaining urethane may cause sealing problems during and after installation.

1. In the window opening, using a razor knife, remove any loose urethane, and trim the high spots in the remaining urethane to provide for an even application surface for the new material.

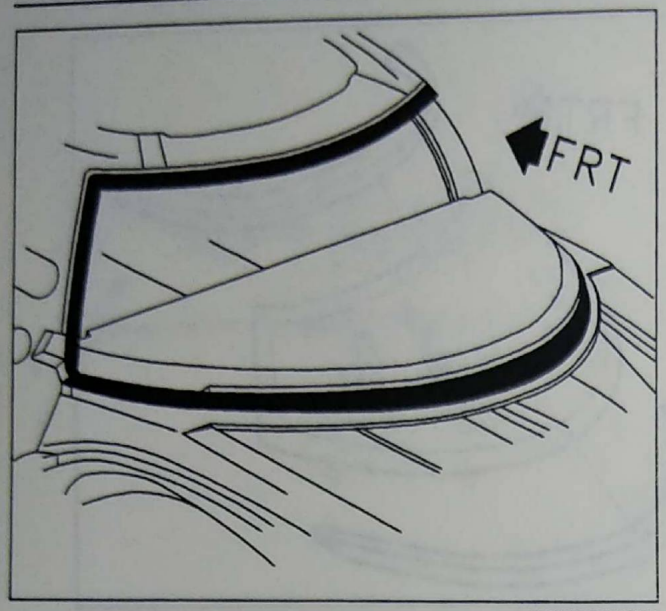
2. If old glass is to be re-installed, all urethane must be removed from the glass.

3 Install upper and lower rear glass moldings. Align upper molding lower edge notch with the square marking on the interior side of the back glass. Align and install the lower molding on the glass in the same manner as the upper. Apply molding from the center out, working to the ends.

4. Before installing urethane, pre-fit the glass with the aid of a helper, center glass to the roof, and with upward pressure, seat the upper glass molding to the roof.

5. Once glass is correctly located, tape two pieces of masking tape over the edge of the glass onto the roof panel approximately 400 mm (16 in.) on each side of me center line. Slit tape at edge of glass molding. Luring installation, tape on glass can be aligned with tape on body to guide glass to desired position. With the aid of a helper, remove glass.

6. ^an the entire window and window opening with lint cloth^ 3 c^ean> free, alcohol dampened



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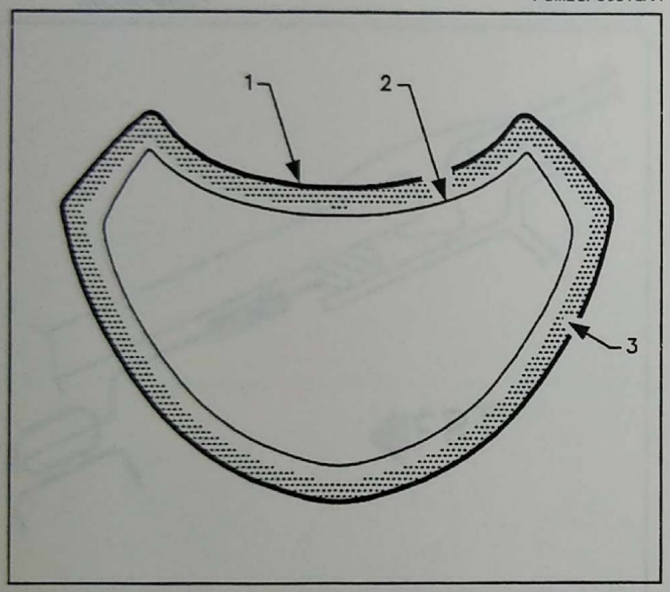
7. If there is any bare aluminum exposed in the window opening, reprime these areas with pinch weld primer #3 from kit #12346284. Follow manufacturer's recommendations for drying time.

IMPORTANT: Do not place pinchweld primer over any existing urethane adhesive.



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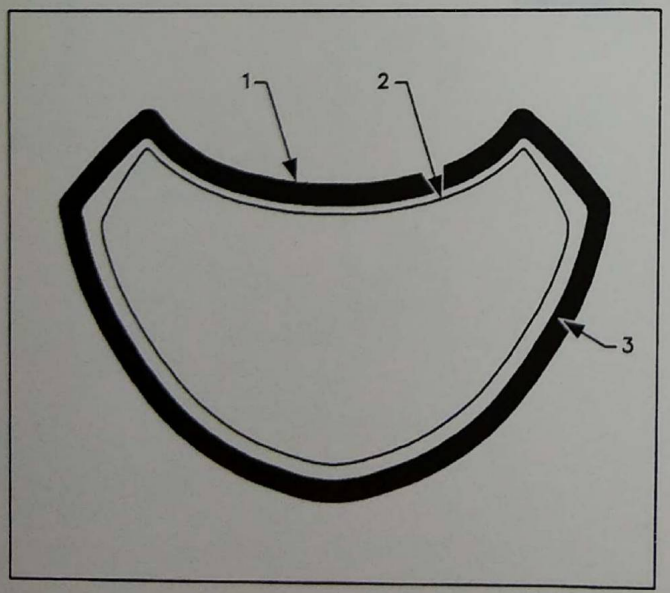
8. Apply clear glass prep #1 from kit #12346284 around the entire perimeter of glass in locations shown. Apply glass prep #1 following the manufacturers specifications.

1 Rear window

2 Edge of blackout

3 Glass prep #1 from kit #12346284



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9. Apply black primer #2 from kit #12346284 around the entire perimeter of glass in locations shown. Allow black primer to dry according to manufacturers specifications.

1 Rear window

2 Edge of blackout

3 Glass primer #2 from kit #12346284

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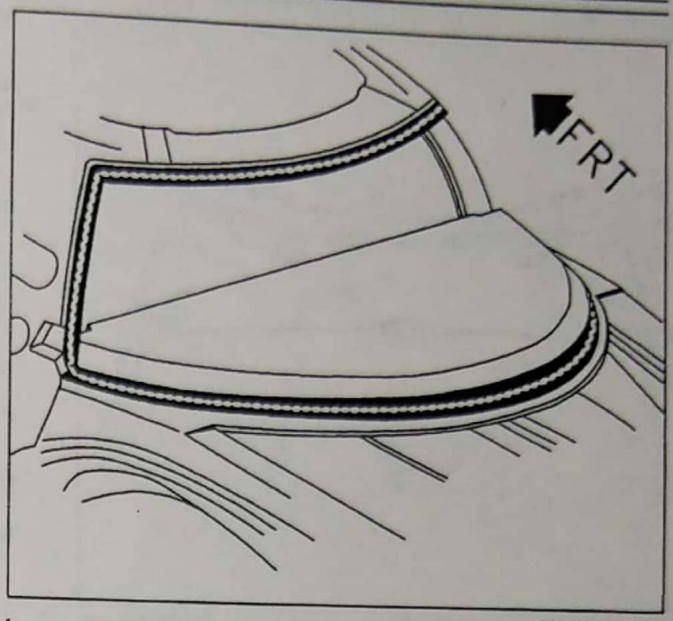
10. Apply a smooth continuous bead of adhesive on top of the old adhesive that is still on the rear glass body opening-



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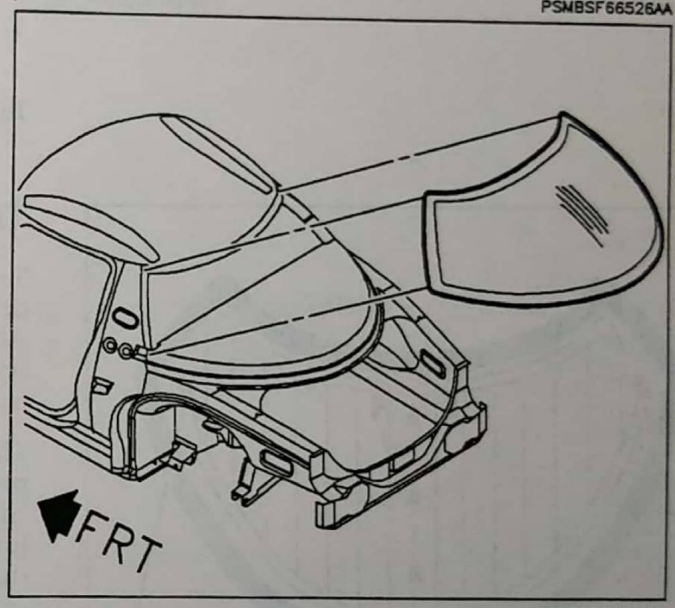
IMPORTANT: The glass must install into the body opening in true body position to prevent smearing the urethane. Do not rock or tip glass into position.

11. With the aid of a helper and suction cups. Lift glass into window opening. Align tape on glass assembly to tape on body.

12. Press glass firmly to wet-out and set adhesive. Use care to avoid excessive squeeze out which would cause an appearance problem. Use tape to hold the glass in its proper position against the front of the roof. The urethane height after installation and properly seated glass is 7 mm (9/32 in.).



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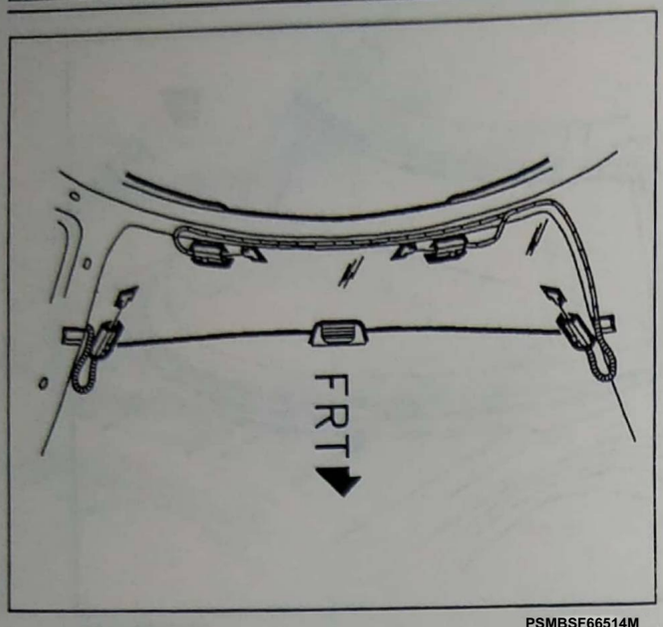

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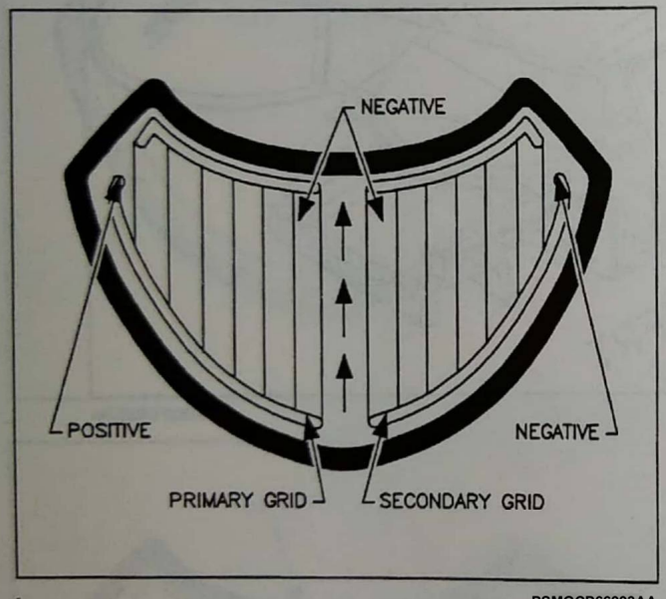
NOTICE: Until the new urethane has cured, air pressure from a closing door may cause the rear glass to move. To prevent this, lower the windows a minimum of 76mm (3 in.) before closing the door. Water applied on top of urethane adhesive during water test or as a separate operation, will speed up the cure of the urethane.

13. Water test vehicle at once using a soft spray. Use warm or hot water if available. Do not direct a hard stream of water at fresh adhesive material.
14. Inspect for leaks from inside the vehicle. Paddle in extra adhesive at leak points using a tongue depressor or similar flat flexible tool.
15. Install the electrical connectors to the bus bars.
16. Install the left and right upper outer quarter panels. (Refer to Upper Outer Quarter Panel Installation" in this manual.)
17. Allow adhesive to diy. (Refer to manufacturer's recommendations.)
18. Clean up and remove any tape or tape residue or broken glass from the vehicle.



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TESTING GRID LINES

To locate inoperative grid lines, select the rear window defogger button on the run lock shifter assembly (RSA). Attach the black lead of the multimeter (set to the 20 volt scale) to ground. Lightly touch the red lead of the multimeter to each grid line.

The multimeter should display battery voltage at the positive side (bottom side) of each grid line. The voltmeter should gradually display less voltage as the red lead of the multimeter is moved toward the negative side (top) of each grid.

If the reading shows battery voltage as the red lead is moved across the grid lines and then makes a sudden jump down to zero volts (ground) that grid line has an open in it.

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REPAIR PROCEDURE

Required:

- GM or Saturn Rear Window Defogger Repair Kit P/N12345345 (or equivalent)
- Heat Gun - capable of 260°C (500°F)

1. place key pad in the “LOCK” mode.
2. Inspect rear window defogger primary and secondary grid lines and mark breaks on grid line outside of glass with a grease pencil.
3. Clean grid line area to be repaired on inside of glass, guff with steel wool and wipe clean using cloth dampened with alcohol. Buff and clean about 6 mm (1/4 in.) beyond each side of break of guide line.

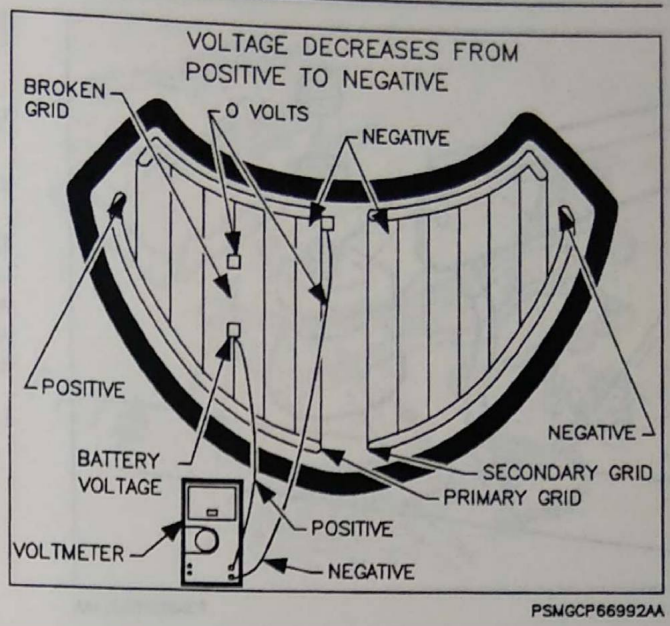
IMPORTANT: Repair decal or tape must be used to control width of repair area. If decal is used, be sure the die-cut metering slot is the same width as the grid line.

4. Install grid line repair decal or two strips of tape positioned above and below repair area.
5. At room temperature, apply grid line repair material to repair area using the applicator provided with kit.
6. Carefully remove the decal or tape.

NOTICE: The grid line repair material must be cured with heat. To avoid heat damage to interior trim, protect the trim near the repair area where heat is to be applied.

7. Apply heat to repair area for one to two minutes holding heat gun nozzle 25-50 mm (1-2 in.) from glass surface. A minimum temperature of 149°C (300°F) is required.
8. Inspect grid line repair area. If repair appears discolored, apply a coating of “Tincture of Iodine” to repair area, using a pipe cleaner or fine brush. Allow iodine to dry for about 30 seconds and carefully wipe off excess, with lint free cloth.
9. Test rear defogger operation to verify grid line repair.

IMPORTANT: At least 24 hours are required for complete curing of repair materials. The unit should not be physically disturbed until after that time.



BUS BAR TERMINAL REPAIR

The rear defogger bus bar terminal can be attached by soldering, using solder containing three percent silver and rosin flux pasted

1. Buff area to be repaired with fine steel wool. This removes the oxide coating formed during glass Manufacture.
2. ^Pply the paste-type rosin flux in small quantities to terminal and bus bar repair area using a brush,
3. The soldering iron tip should be coated with solder beforehand. Use only enough heat to melt the solder and only enough solder to ensure a complete repair,
4. Do not over-heat the terminal when soldering it to the bus bar.

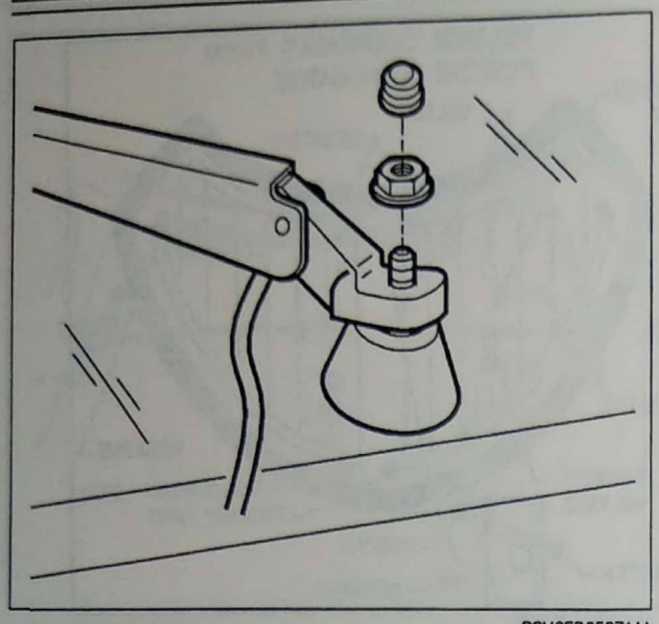
FRONT WIPER/WASHER

WIPER ARM

REMOVAL

IMPORTANT: Before removing the wiper arm, note its location for proper reinstallation. For ease in installation, wipers should be in “In-Wipe” position before removing wiper arm. This is achieved by powering the vehicle down with the wiper motor and arms in the “In-Wipe” position.

1. Remove wiper arm finish cover and retaining nut from wiper arm assembly.



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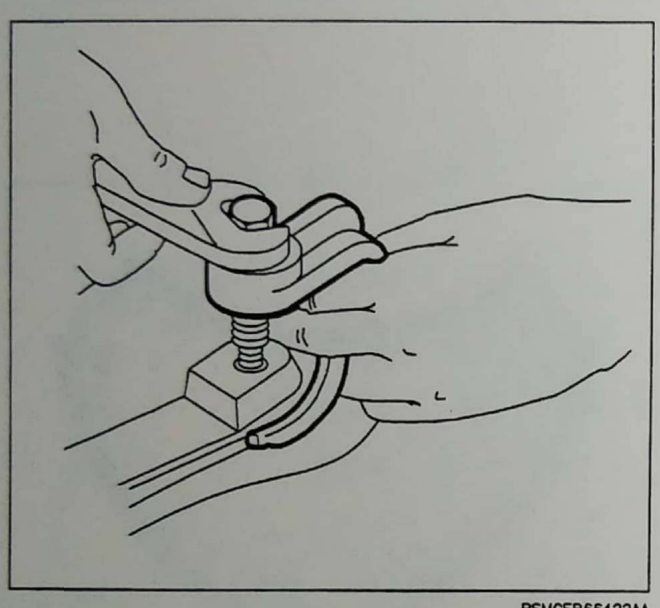
2. Install wiper arm service tool EV9705B around base of wiper arm pivot head.
3. Remove wiper arm assembly.
4. Remove washer hose connector from air inlet screen assembly.



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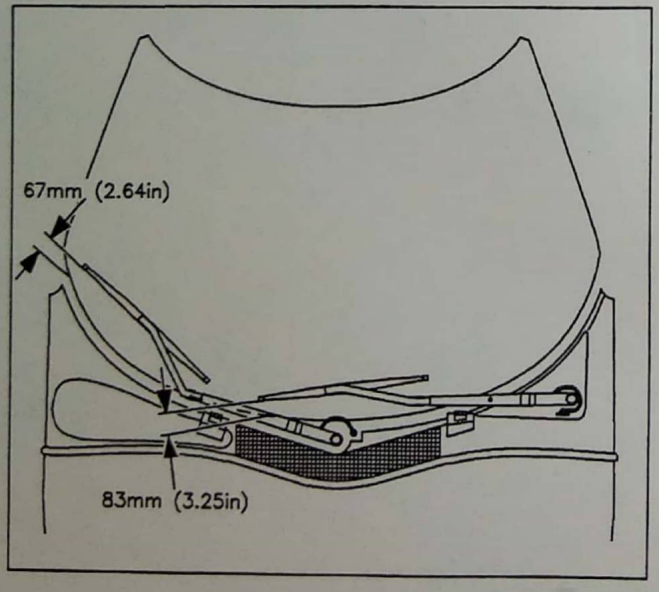
INSTALLATION

IMPORTANT: The “bowed” wiper blade assembly must be installed on the passenger side of the vehicle. The “non-bowed” blade must be installed on the driver side of the vehicle.

1. Install washer hose connector to air inlet screen assembly.
2. Set windshield wiper switch to the “DELAY WIPE” mode. Power down the vehicle when the wipers are at the “IN-WIPE” position on the windshield.
3. Position wiper arm onto pivot shaft such that the correct “IN-WIPE” demensions are:
   Passenger’s side = 67 mm (2 - 41/64 in.)
   Driver’s side = 83 mm (3 -1/4 in.)
   from the bottom edge of the windshield to the tip of wiper blade. Push wiper arm pivot head down onto tapered splines.
4. Install fastener and torque as specified.

Torque: 23 N«m (17 ft-lbs)

5. Install wiper arm finish cover onto retaining nut.



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SCREEN ASSEMBLY - AIR INLET

REMOVAL

1 *Remove* wiper arm assemblies. (Refer tn <<w Ann" procedure in this service manual)

2- Rcm0^ “ If?2"ers ho,d'ng air inlet screen assembly to cow l panel.

3. Remove windshield w asher hose.

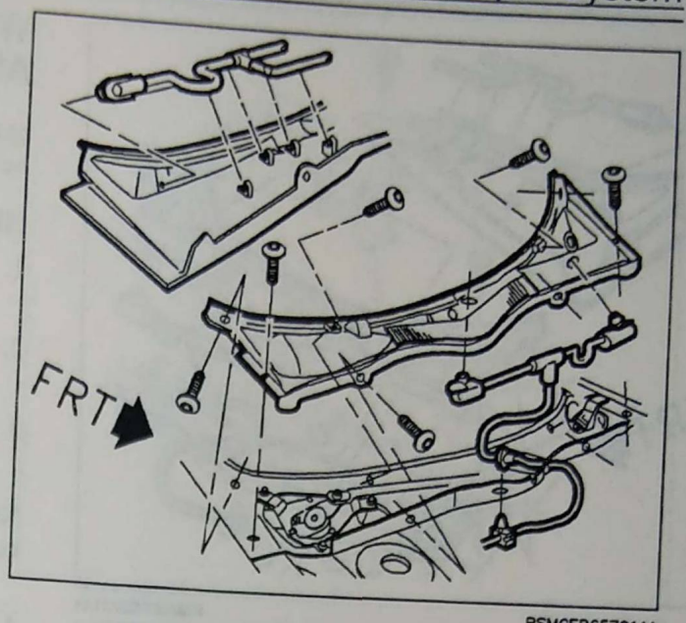
4. S"ea'ri"le,SCree"“S-Waw ay wl panel.

INSTALLATION

1. Install w asher hose to air inlet screen assembly and install air inlet screen assembly at base of windshield

2. Install screw-in retainers to air inlet screen assembly and cow’l panel.

3. Install wiper arm assemblies. (Refer to “Wiper Arm” procedure in this service manual.)



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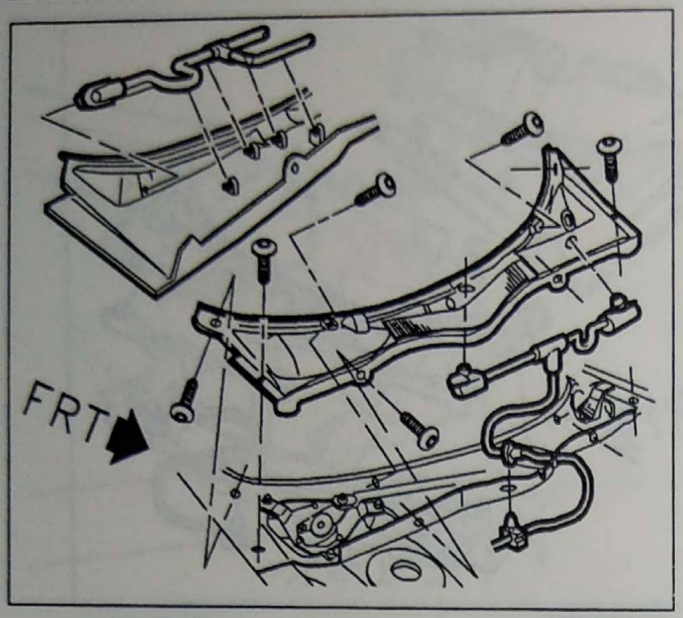

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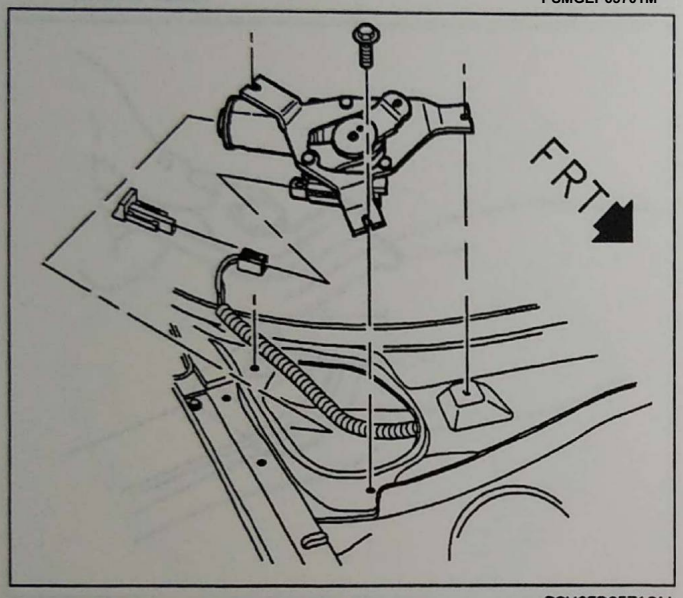
WIPER MODULE AND MOTOR ASSEMBLY

IMPORTANT: A new wiper motor/bracket assembly will be shipped in the "In-Wipe" position.

REMOVAL

1. Remove wiper arm assemblies. (Refer to "Wiper Arm" procedure in this service manual.)
2. Remove fasteners retaining air inlet screen assembly to cowl panel.
3. Remove air inlet screen assembly. (Refer to "Air Inlet Screen Assembly" in this service manual.)

NOTICE: Use care when removing wiper module from cowl to avoid pivots contacting windshield.



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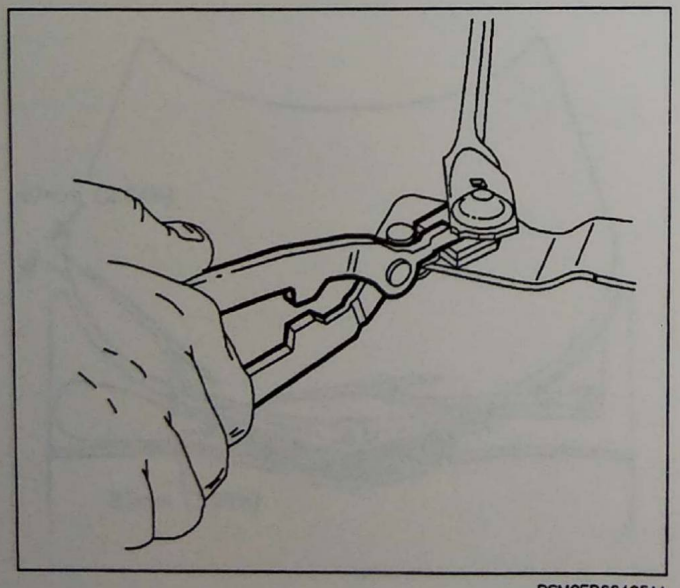
4. Remove wiper module fasteners, partially remove wiper module. Remove connector- positive assurance CPA and disconnect wiring from wiper motor/bracket assembly.

IMPORTANT: The wiper motor crank arm is not serviced separately and should not be disconnected from the wiper motor. The crank arm is positioned in the wiper motor to allow the wiper arms to return to their normal park position.



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5. Remove wiper transmission arm from wiper motor assembly using service tool EV9704B.
6. Remove wiper motor assembly from vehicle.

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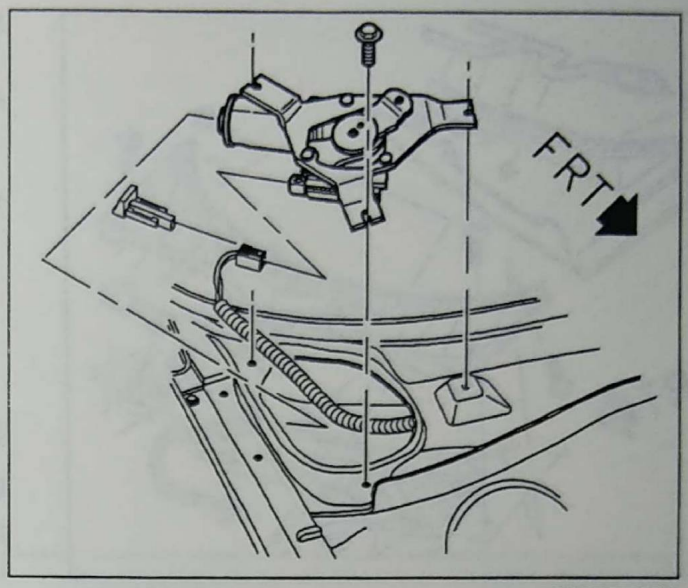
INSTALLATION

[IMPORTANT: The wiper motor/bracket assembly will I be shipped in the "In-Wipe" position. The wiper motor I must be installed as received. Do not rotate the crank I arm.

1. Connect wiper motor harness to wiper motor. Secure harness assembly with CPA retainer.
2. Install wiper motor to cowl panel with three bolts. Torque as specified.

Torque: 10 N*m (89 in-lbs)



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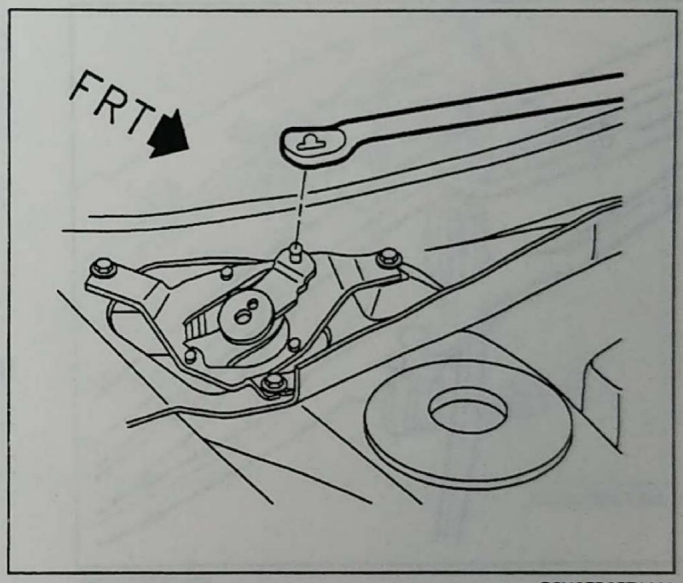
3. Position right hand wiper transmission arm over/above wiper motor/bracket ball stud located on crank arm. Do not rotate wiper crank arm.



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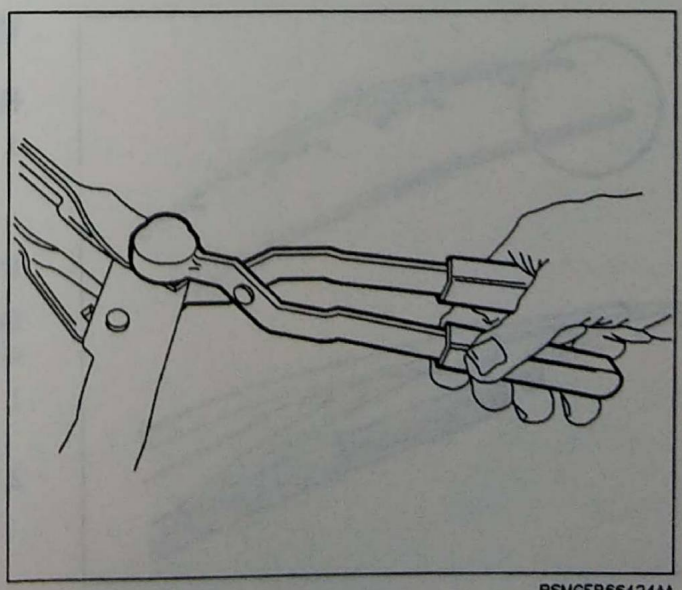
4. Snap fit transmission arm onto motor/bracket ball stud using service tool EV9703B.



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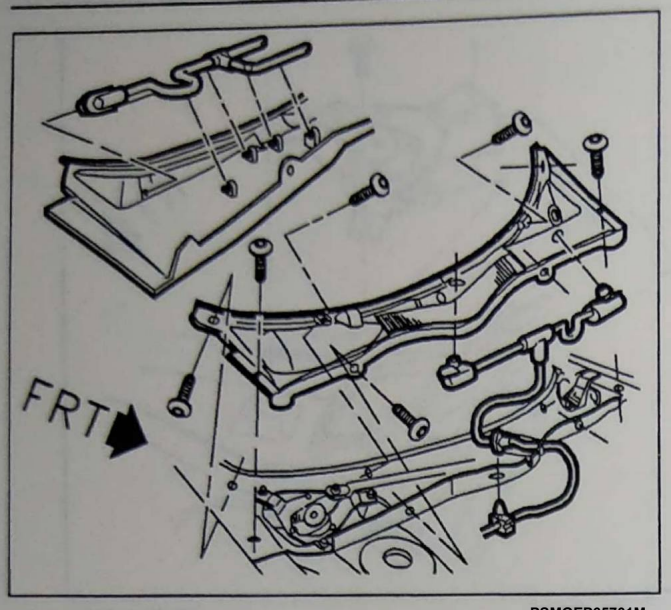

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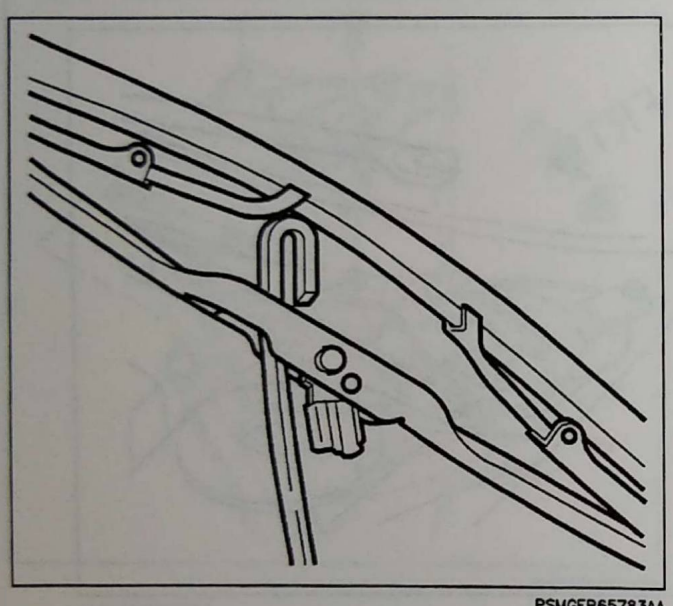
5. Install screw-in retainers holding air inlet screen assembly to cowl panel.
6. Set windshield wiper switch to the "DELAY WIPE" mode. Power down the vehicle when the wipers are at the "IN-WIPE" position on the windshield
7. Position wiper arm onto pivot shaft such that the correct "IN-WIPE" demensions are:
   Passenger's side = 67 mm (2 - 41/64 in.)
   Driver's side = 83 mm (3 -1/4 in.)
   from the bottom edge of the windshield to the tip of wiper blade. Push wiper arm pivot head down onto tappered splines.
8. Install fastener and torque as specified.

Torque: 23 N'm (17 ft-Ibs)

9. Install wiper arm finish cover onto retaining nut.

WIPER BLADE



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IMPORTANT: Right and left wiper blades are different. Make sure to check that the "bowed" blade is installed on the passenger side of the vehicle. Also, the "non-bowed" blade is installed on the driver side of the vehicle.

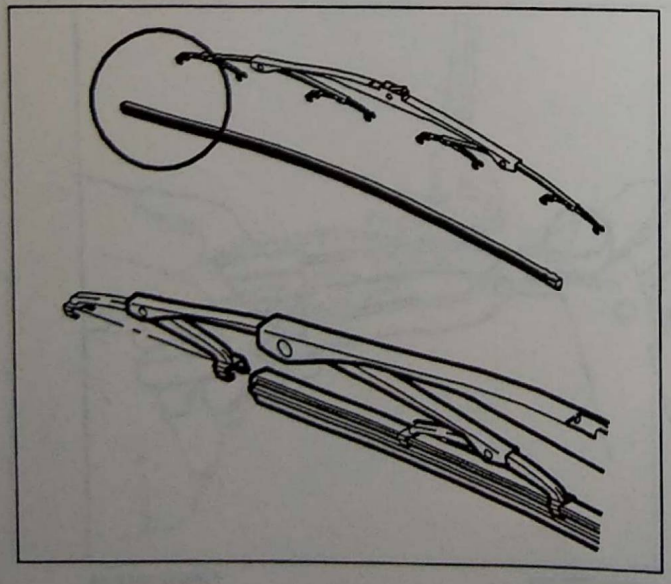
REMOVAL

1. Lift wiper arm away from glass.
2. Pinch wiper blade attachment clip together and slide blade out of wiper arm hook.

INSTALLATION

1. Position wiper arm blade into wiper arm hook.
2. Slide blade assembly into hook until it clicks into position.

WIPER BLADE INSERT



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REMOVAL

1. Remove existing wiper blade insert by pulling on insert at base of wiper blade assembly until insert is fully removed.

INSTALLATION

IMPORTANT: Wiper blade insert can be installed from either end of wiper blade.

1. Install wiper blade insert to wiper blade by installing wiper insert cap onto end of blade insert.
2. Slide wiper blade insert until wiper blade engages lock at end of wiper blade insert.

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WIPER SYSTEM - WINDSHIELD WASHER SOLVENT CONTAINER

REMOVAL

1 Remove engine compartment front sight shield. (Refer to “Engine Compartment Front Sight Shield” procedures in this service manual.)

2. Disconnect pump motor wiring harness from pump motor.

3. Lift out power steering reservoir from attachment bracket.

NOTICE: Use caution when moving power steering reservoir to avoid spilling power steering fluid on painted surfaces.

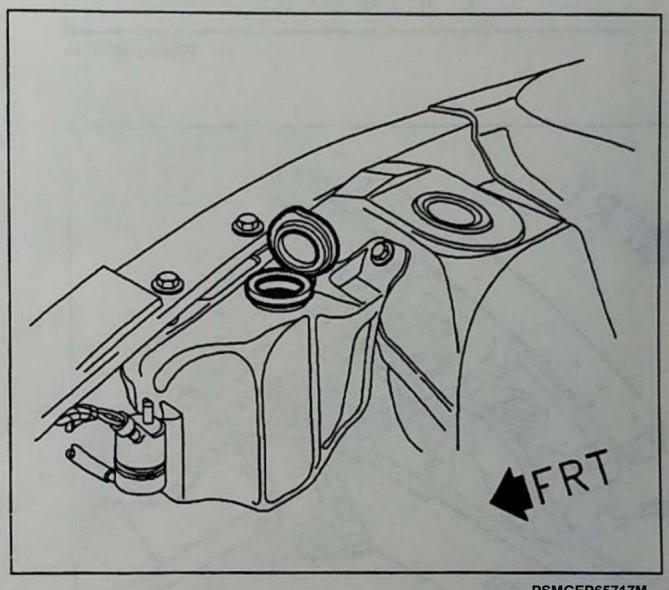
4. Remove fasteners attaching windshield washer solvent container.

NOTICE: Use caution when removing hoses from washer system components to avoid spilling washer fluid on painted surfaces.

5. Lift windshield washer solvent container and remove fluid hose from pump. Pinch-off, or plug hose immediately to prevent fluid from draining.

6. Remove windshield washer solvent container from vehicle.

7. Empty fluid from windshield washer solvent container into a holding container.



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INSTALLATION

1. Install fluid hose to washer pump.

2. Position windshield washer solvent container and install fasteners attaching windshield washer solvent container to body. Torque as specified.

Torque: 6 N*m (53 in-Ibs)

3. Connect pump motor wiring harness to pump motor.

4. Fill windshield washer solvent container with washer solvent.

5. Check that washer pump operates properly.

6. Install engine compartment front sight shield. (Refer to “Engine Compartment Front Sight Shield” procedures in this service manaul.)

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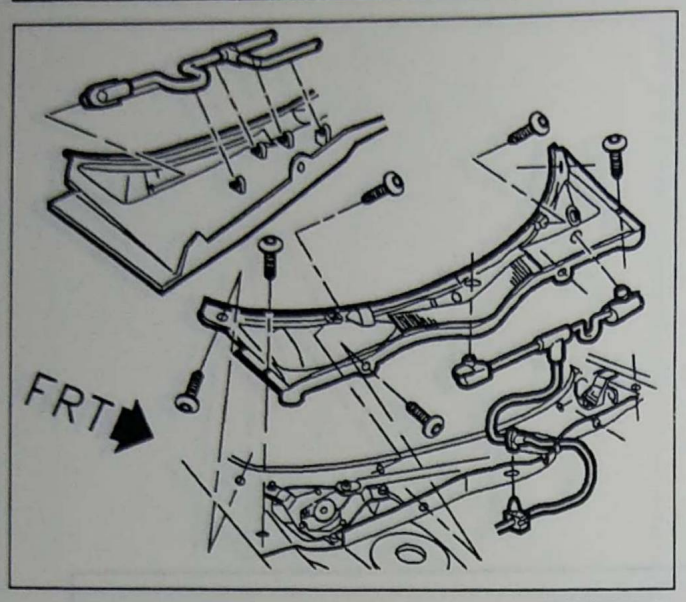

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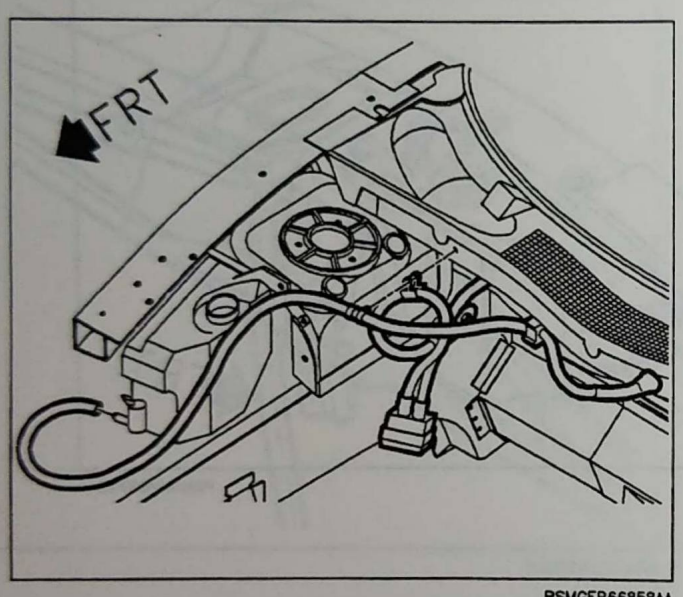

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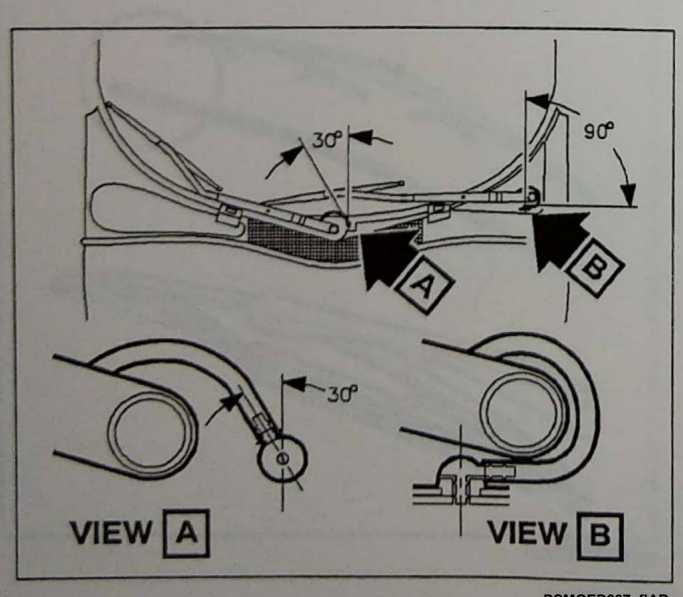

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WASHER HOSE ROUTING

REMOVAL

1. Remove wiper arm assemblies. (Refer to "Wiper Arm" procedure in this service manual.)
2. Remove air inlet screen assembly. (Refer to "Air Inlet Screen Assembly" procedure in this service manual.)
3. Remove washer hose grommet from upper cowl panel.
4. Remove hose from retaining clips along front of cowl panel.

NOTICE: Use caution when removing hoses from washer system components to avoid spilling washer fluid on painted surfaces.

5. Remove washer fluid hose from washer pump. Pinch-off or plug hose immediately to prevent fluid from draining.
6. Pull washer hose through upper cowl panel and remove from vehicle.

INSTALLATION

1. Install washer hose to washer tube connector on air inlet screen assembly.
2. Feed washer hose through cowl upper and engage grommet to cowl panel opening.
3. Route washer hose using retaining clips across front of cowl as shown in illustration.
4. Install washer fluid hose to washer pump.
5. Install air inlet screen assembly to cowl panel with eight screw-in retainers.
6. Position washer tube connector to 30° (RH) and 90° (LH) as shown.
7. Install windshield wiper arm hoses to washer tube connectors. Route hoses rearward and above wiper arms as shown.
8. Install wiper arm assemblies. (Refer to "Wiper Arm" procedure in this service manual.)

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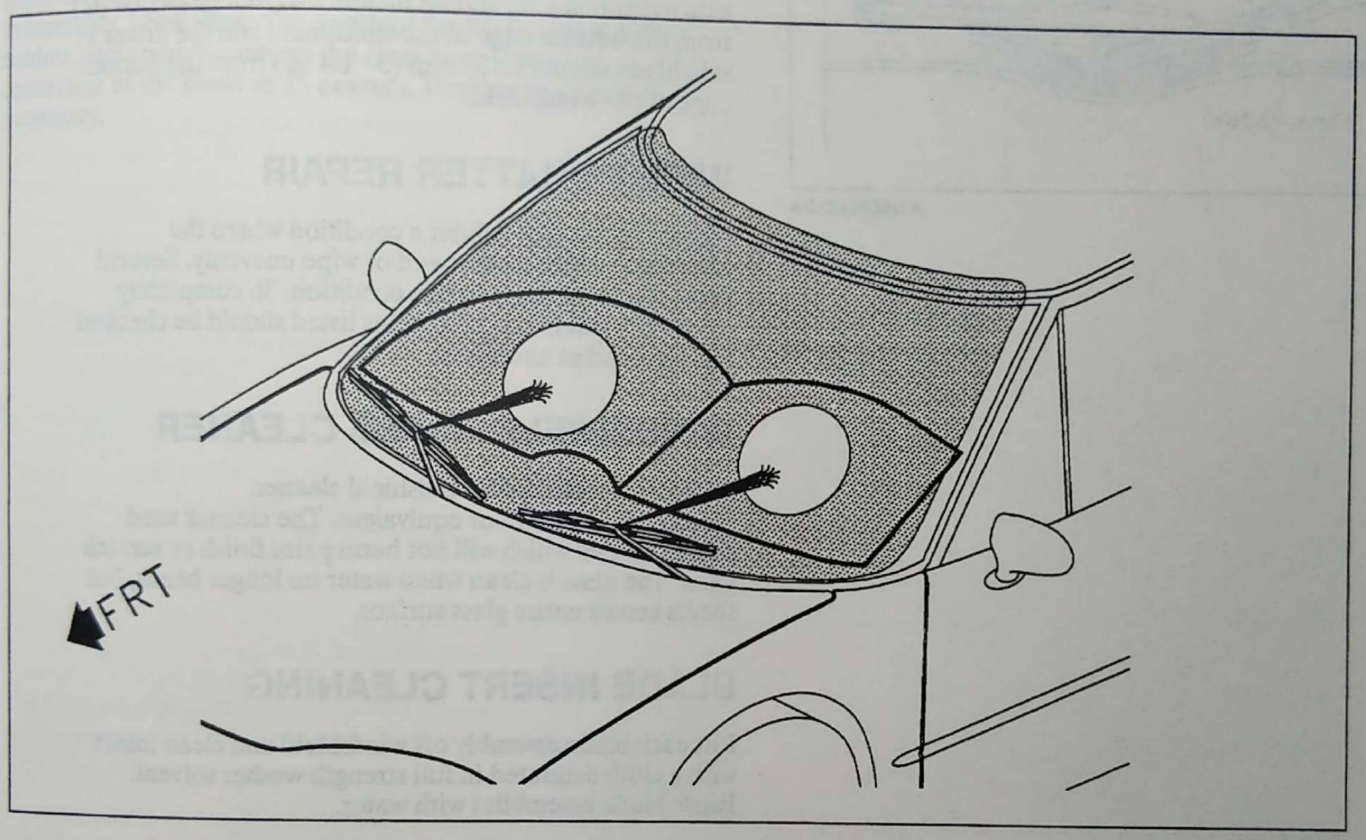
WASHER NOZZLE SPRAY PATTERN

nc washer nozzle spray pattern is identified in the
A illustration. If the washer nozzle is not rid™ • . . . w
fluid according to the illustration, make sire thS th?"
nozzle is properly seated in the wiper arm assem ly.
Make sure that both nozzle assemblies arc nr b . . . t
installed. Check to make sure washer hose k nS* 7
disengaged, kinked, or torn. If the spray of washer n . . . ui
still does not match the illustration, replace both
of the washer nozzle as required. P °ne Or

WINDSHIELD WASHER

A correctly operating windshield wiper/washer system has a spray pattern that cleans 75% of the wipe pattern within ten cycles.

If the washer nozzle or connecting hoses become plugged, apply air pressure from nozzle end to clean or purge system. Drain and clean washer reservoir to remove foreign particles which may have been blown into washer fluid. If nozzle or connecting hoses remain obstructed, replace. Do not use wire or sharp object to unplug washer hose.



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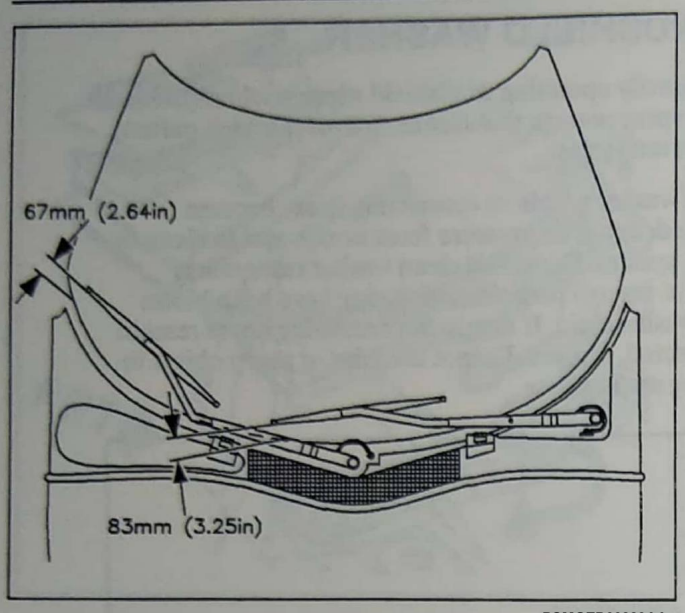

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WIPER ARM ASSEMBLY ADJUSTMENT

The only adjustment of the wiper arm(s) is to remove the arm(s) from the serrated transmission drive shaft, rotate the arm(s) as required and reinstall on drive shaft. Inspect for proper blade out-wipe position and park position.

INSPECT

Set the windshield wipers switch to the "DELAY WIPE" mode. Power down the vehicle when the wipers are at the "In-Wipe" position on the windshield. The passenger's side wiper blade tip should measure 67 mm (2 - 41/64 in.) from the bottom edge of the windshield and the driver's side blade should be 83 mm (3 -1/4 in.) from the bottom edge of the windshield.

WIPER CHATTER REPAIR

Some vehicles may exhibit a condition where the windshield wiper chatter and/or wipe unevenly. Several items may contribute to this condition. To completely repair this condition, ALL items listed should be checked and repaired as necessary.

WINDSHIELD GLASS CLEANER

Clean windshield with windshield cleaner, Saturn PN 01051515 or equivalent. The cleaner used should be one which will not harm paint finish or scratch glass. The glass is clean when water no longer beads, but sheets across entire glass surface.

BLADE INSERT CLEANING

Lift each blade assembly off windshield and clean insert with a cloth saturated in full strength washer solvent. Rinse blade assemblies with water.

CAUTION: AVOID PROLONGED SKIN CONTACT WITH WASHER SOLVENT.

WIPER ARM PRESSURE CHECK

1. Run wiper arm and blade assemblies to mid-wipe position.
2. Remove blade assemblies from wiper arm assemblies.
3. Attach a scale to wiper arm attaching pin and measure the force required to lift the wiper arm perpendicular to windshield to normal working height (height with blade attached).
4. If the force required is not within the specifications given below, the wiper arm should be replaced.

Tip-Pressure— 8 - 10 N
29 — 36 ounces

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BLADE ASSEMBLY MOUNTING ANGLE CHECK

With the wiper arm and blade assemble • the middle of a wipe stroke and the wiper blade assembl" S removed, visually check that the blade attaching n' each wi Per arm is parallel to the windshield Rent..^" p C the wi per arm assembly if necessary.

BLADE INSERT SET CHECK

Remove the wiper blade assemblies from the wiper arm assemblies. being careful to note orientation for reassembly. Look down the length of the blade insert Th. rubber insert which contacts the glass must be on th.' centerline of the blade ± 15 degrees. Replace the insert if necessaiy.

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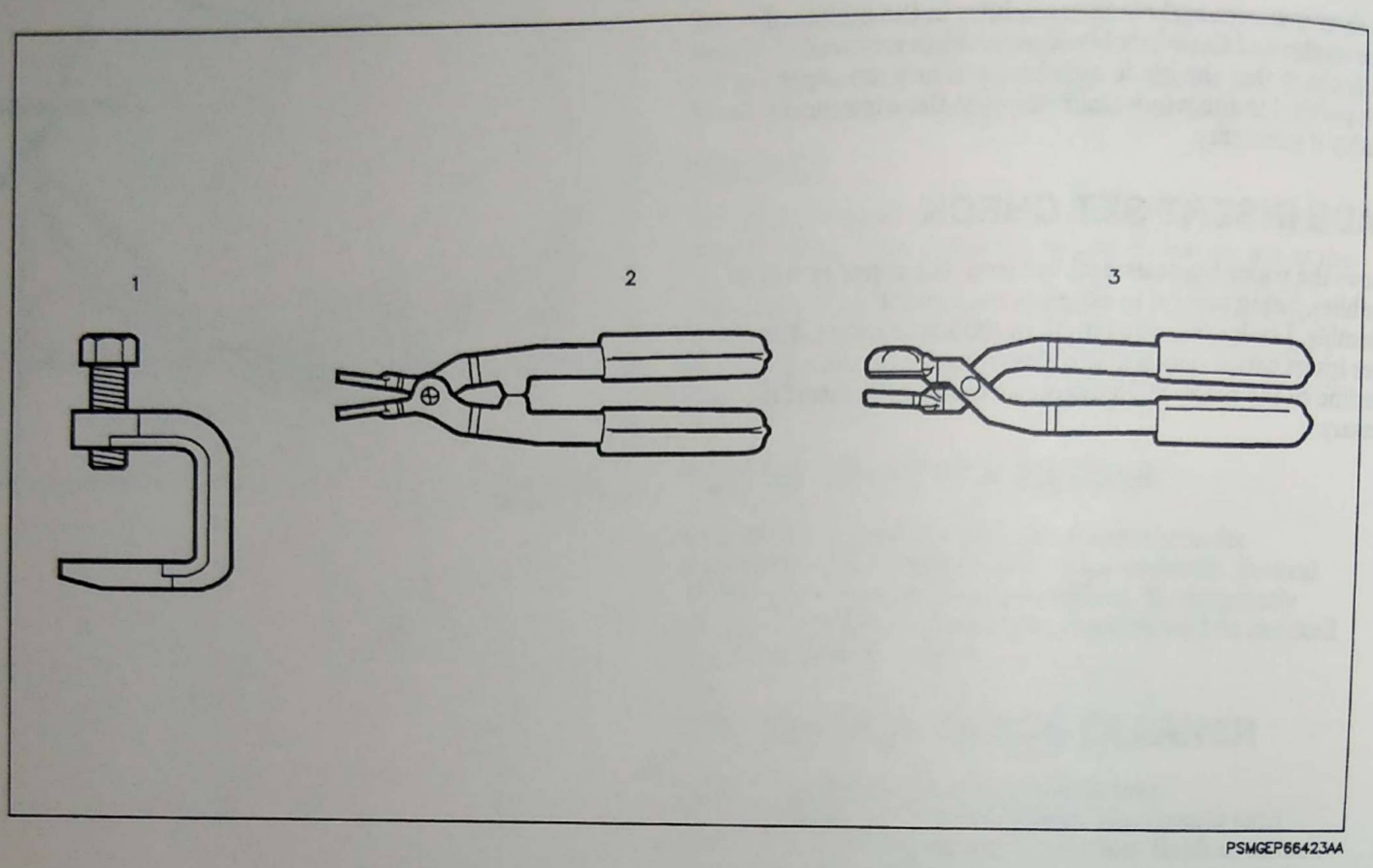
SPECIAL TOOLS



1. EV9705B — Wiper Arm Puller
2. EV9704B - Wiper Linkage Separator
3. EV9703B - Wiper Linkage Installer

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COLLISION REPAIR INFORMATION

This type of body construction requires that uniframe components be aligned properly to assure correct suspension location and dimensioning of underbody and upperbody components. Since each individual unibody component contributes directly to the structural integrity of the body, it is essential that proper welding, sealing and rustproofing techniques be observed when performing service and body operation.

The EVl is a spaceframe vehicle, and what it is made of is unique by design. The vehicle structure is constructed of aluminum. The joining of structural components is done by bonding, welding, and riveting components together. There are three types of aluminum used. There are stampings made of sheet aluminum, castings of aluminum, and extrusions of aluminum. The sheet HO stamping is referred to as a 5754 aluminum alloy. The casting is referred to as A356-T6 aluminum. The extrusions are referred to as 6063-T6 and C210-T6 aluminum. For more information on the locations of these materials see the structural and structural sections of this service manual.

The aluminum is chemically pre-treated to enhance the bondability of the factory applied adhesive material. The pre-treatment process produces a thin coating layer of chromium on the surface, which serves to stabilize and protect the surface for consistent wetting and bonding of the factory applied adhesive.

NOTICE: The chemically pretreated aluminum is important for the bondability of the factory applied adhesive. The SIP pre-treatment will be substituted for the factory applied aluminum pre-treatment. (For more information on SIP see the “SIP” section of this service manual.)

One of the first steps in repairing damage to an EVi’s uniframe construction is to determine the extent of the damage to the vehicle’s structure. Body dimension charts are provided to assist you in identifying and repairing the damaged areas. For more information on how to repair an electric vehicle refer to the “Body/Collision Service Manual.”

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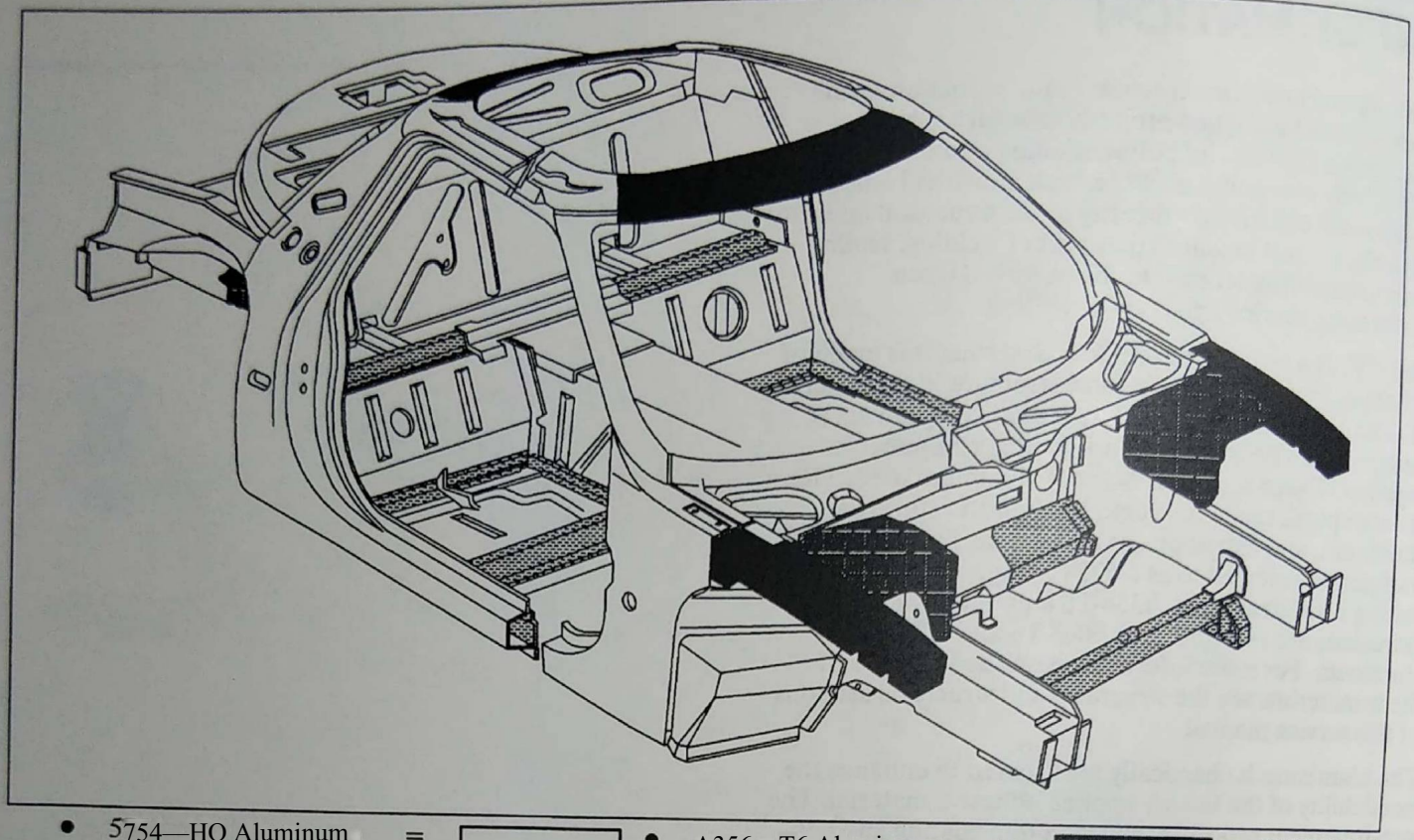
STRUCTURAL



- 5754—HO Aluminum =
- C210—T6 Aluminum =
- A356—T6 Aluminum =
- 6063—T6 Aluminum =

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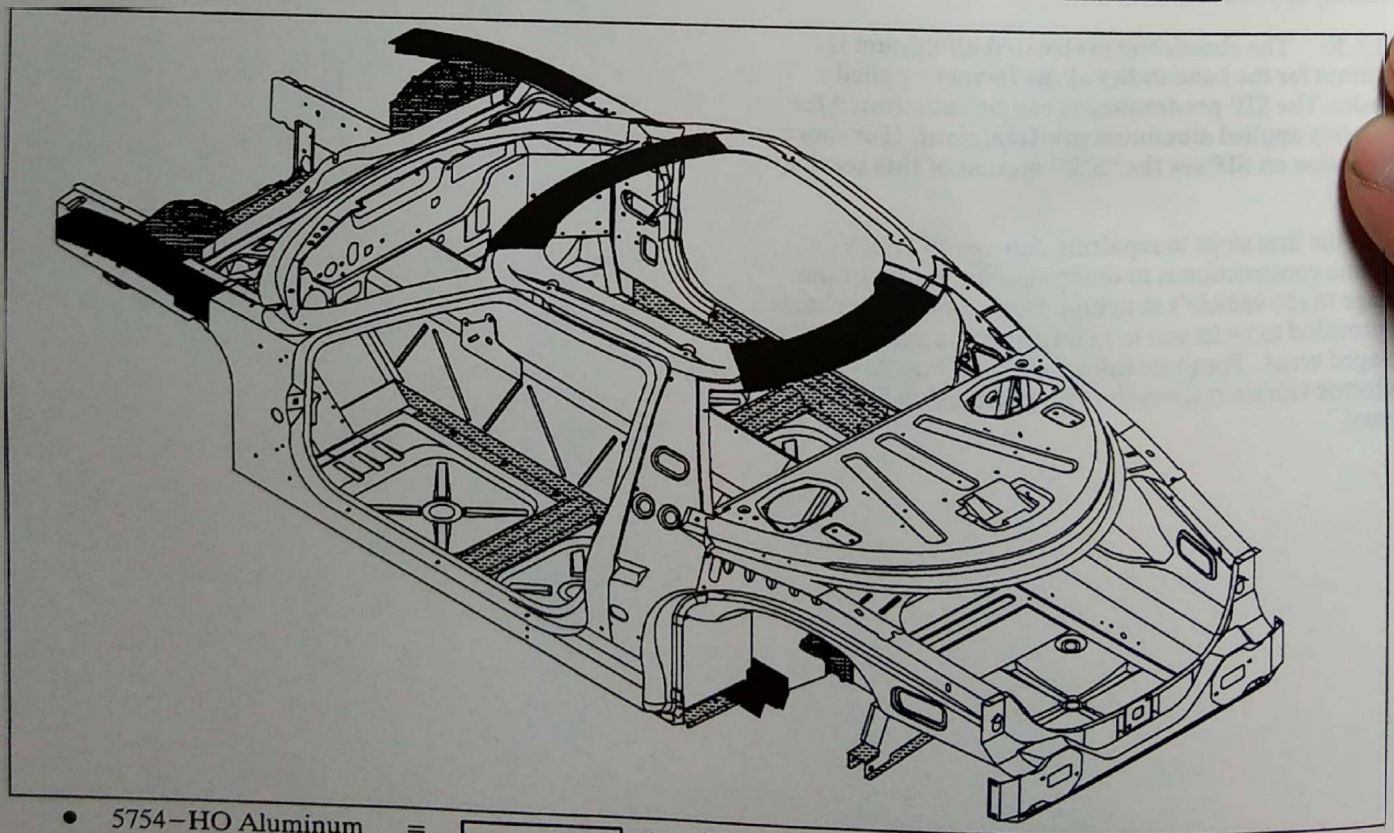

- 5754–HO Aluminum =
- C210—T6 Aluminum =
- A356– T6 Aluminum =
- 6063—T6 Aluminum =

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HEATING AND STRAIGHTENING ALUMINUM

A

\OTICE: Care must be taken not to damage any adhesive between joints in areas of the structure that will not be replaced. Remember that the aluminum can transfer the heat a considerable distance from the area you may be heating. Use heat damming material and or wet rags to control the heat transfer.

The sheet stamping parts can be heated to 300°F (148°C). The use of a heat crayon is most useful in this application. Aluminum doesn't change color when heated. To ensure heat limit is not exceeded, heat damming material usage is necessary around areas of adhesive. To minimize potential of heat damage to bonded joint. When heating a panel, every effort must be made to avoid destroying the adhesive bond between the panels. Some type of heat monitoring device is necessary for monitoring temperatures. Use either a heat crayon or heat paint.

ADHESIVE

The EVi body structure is adhesively bonded, riveted and spot welded together. The adhesive provides for stiffer and stronger joints, thus contributing to the durability of the structure under service loads. This adhesive which is orange in color, is a single part heat curable epoxy'. All of the aluminum in the body structure is pre-treated for compatibility with this weld/bond joining process. Since this process is not feasible in after market repair facilities a two part room temperature cure adhesive is required. For more information on how to repair structural components refer to the "Body/Collision" Service Manual.

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SELF INDICATING PRETREATMENT (SIP)

IMPORTANT: This is an outline of how the SIP chemical works. For more information and steps on proper usage, refer to the “Collision/Repair” service manual and read and understand the manufacturer recommendations.

IMPORTANT: Read and understand all repair procedures and processes before beginning any repair to the structure. These can be found in the body collision service manual.

The SIP is a chemical required when doing structural repairs where adhesive bonding work is required. This chemical process insures that the bonding surfaces will be properly prepared for bonding of the structural adhesive to the aluminum. The SIP insures that the surface is clean of all oxidation, oil, wax and other surface contaminants, by using a visual aid process that indicates whether or not the surface is clean. The SIP creates a temporary atmospheric barrier to prevent oxidation. First a cleaning of the surfaces to be bonded with an aluminum type cleaner such as PPG’s chemfil aluminum cleaner DX533 or equivalent. Mix the solution of aluminum cleaner following the manufacturers recommendations, and follow all directions on application. Then apply the mixed SIP solution on the area. If the SIP solution when applied, spreads out and stays in a complete unbroken coverage, the area is clean. If it pulls itself together forming beads like water on a fresh waxed hood of a vehicle or spreads away and moves around, the surface is still dirty. Cleaning of the area will need to be repeated until desired results are achieved. The SIP is left for a few moments then it is patted dr)' using a clean tissue. Allow the remaining residual coating to dry. The dry coating will provide a short term surface protection (about 12 hours) keeping the surface from oxidizing. When using adhesive “NO” oxidation can be present in the bonding area.

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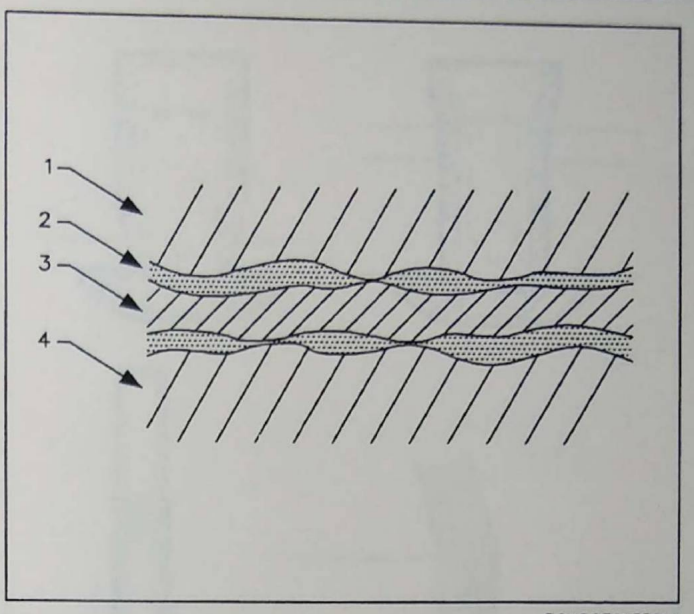
Cutaway view of a welded bonded aluminum structural weld flange:

1 Aluminum

2 SIP

3 Adhesive (Which has a strong bond by using the SIP and having a clean surface to bond to).

4 .Aluminum



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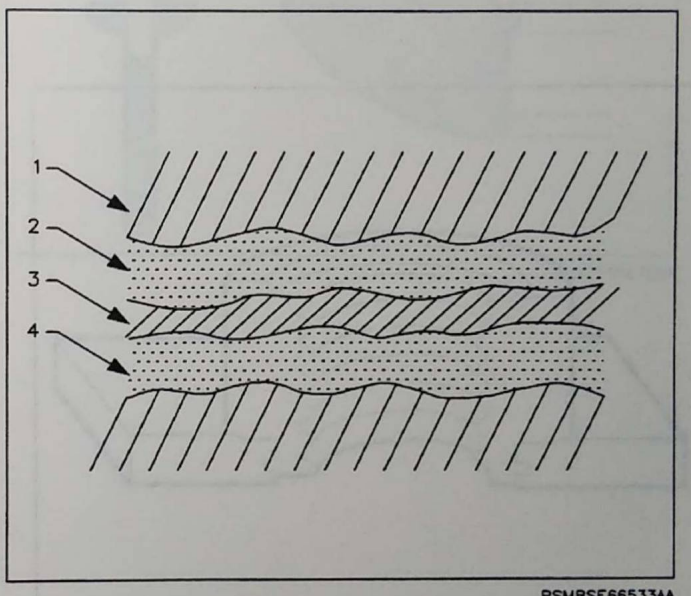
Cutaway view of a welded bonded aluminum structural weld flange with no cleaning and SIP application:

1 Aluminum

2 Oxidation layer

3 Adhesive (With no direct bond to the aluminum).

4 Oxidation Layer



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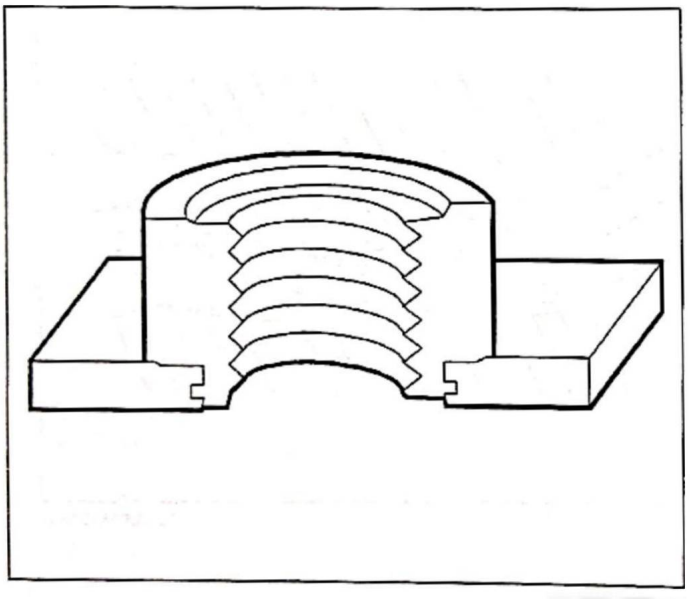
FASTENERS

NOTICE: Do not use fasteners that are used on a conventional steel structure. Fasteners that are for a steel structure are inappropriate for use in an aluminum structure. For more information on fasteners, refer to "Fastener Usage" section of this service manual.

IMPORTANT: Read and understand all repair procedures and processes before beginning any repair to the structure.

A significant amount of time and effort went into identifying and selecting appropriate fasteners for the EVi. All EVi fasteners arc specially coated to inhibit corrosion. Fasteners that arc un-coated, will create a dissimilar metal corrosion that will occur in a relatively short period of time. This corrosion, if left unattended can lock in fasteners due to corrosion, or will eventually cause the surrounding aluminum to severely deteriorate. ' Corrosion testing indicated that the coating provides 10 ycar/160 000 km (100 000 miles) corrosion protection. The following information may be used to help in understanding fasteners for the EVi and the aluminum structure's coated fasteners usages.

There are two categories of fasteners in the EVi structure: structural and attachment. Structural fasteners are those fasteners which are used to attach one part of the structure to another part of the structure. Rivets are the most common type of structural fastener used within the EVi structure. For more information on riveting, refer to the "Riveting" section in this manual. Attachment fasteners are those fasteners which are used to attach parts from other vehicle subsystems to the body structure. It is important to recognize that only those fasteners which are not made as a permanent part of the structure are counted as attachment fasteners. In most cases for an attachment fastener, there is another loose fastener such as a bolt, that is required to actually attach the interfacing part to the structure.



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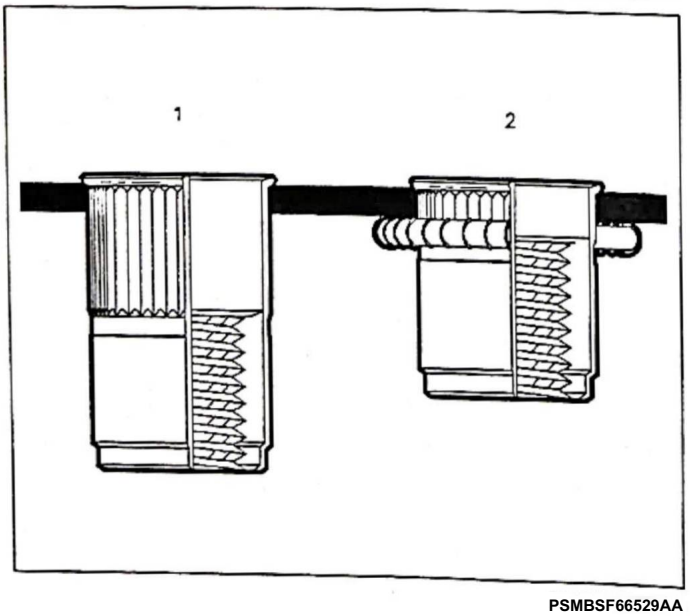
Fasteners play an important role in the design of the structure since so many other vehicle sub-systems attach to the body structure. The only fasteners that will be discussed in this section are insert nut, insert stud, strux nut, strux stud for mechanical threaded fasteners, all of which are coated to inhibit corrosion.



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View of insert nut positioned in panel.

1 Before crimping nut.

2 After crimping and fastened to panel.

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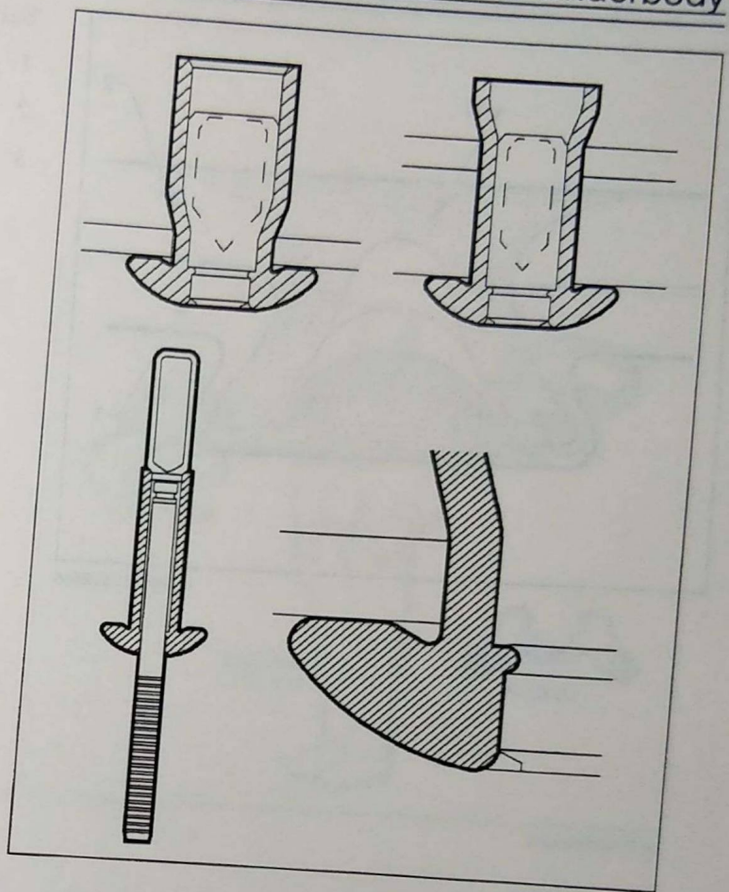
RIVETING

IMPORTANT: NO specific number of rivets will be pvcn for any riveting procedure, except where rivets are used for senace only procedures.

Almost all of the structural fasteners on the EVi are rivets. There are two types of rivets used on the FV? These are. large pull rivets and self pacing rivets Self piercing nvets are relatively a new fastener to the industry. Replacement of this rivet with the same type is not possible in the collision repair facilities facility. If replacement is required, replace with recommended replacement rivet available through Saturn Service Parts Operations.



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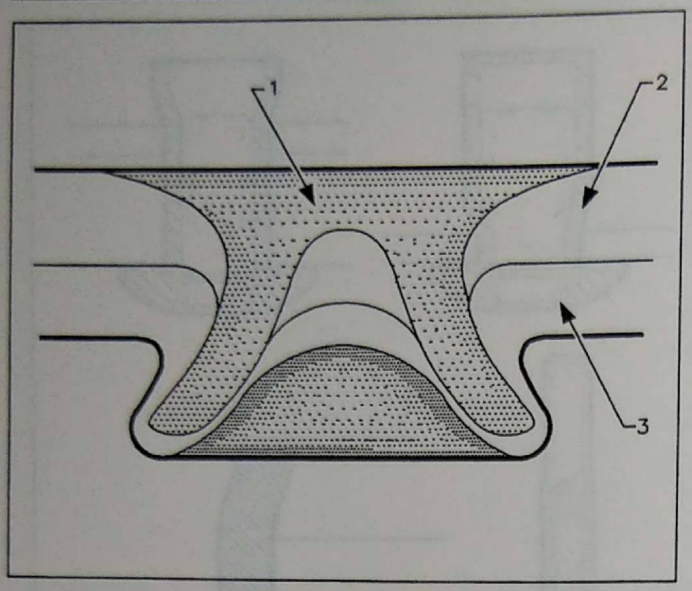

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Self piercing rivet: (Cut away view)

1 Rivet

2 Upper layer pierced

3 Lower layer unpierced

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WELDING

TES T WELDS

< TION: WHEN WELDING ALUMINUM, L-LPING ST BE D0NEIN A PROPERLY U NTILATED AREA.

CU-TION: PROTECT YOURSELF BY WEARING S4FETV GLASSES. EARPLUGS. RESPIRATOR. CLONES. AND S AFETY SHOES WHILE PERFORMING WORK ON VEHICLE.

CAUTION: EXPOSURE TO WELDING IS EXTREMELY HARMFUL TO THE EYES AND SKIN \ND LUNGS. PROLONGED EXPOSURE CAN CAUSE BLINDNESS, BURNS, AND RESPIRATORY PROBLEMS. NEATER BEGIN WELDING UNLESS YOU ARE WEARING EYE PROTECTION, PROTECTIVE CLOTHING, AND A RESPIRATOR.

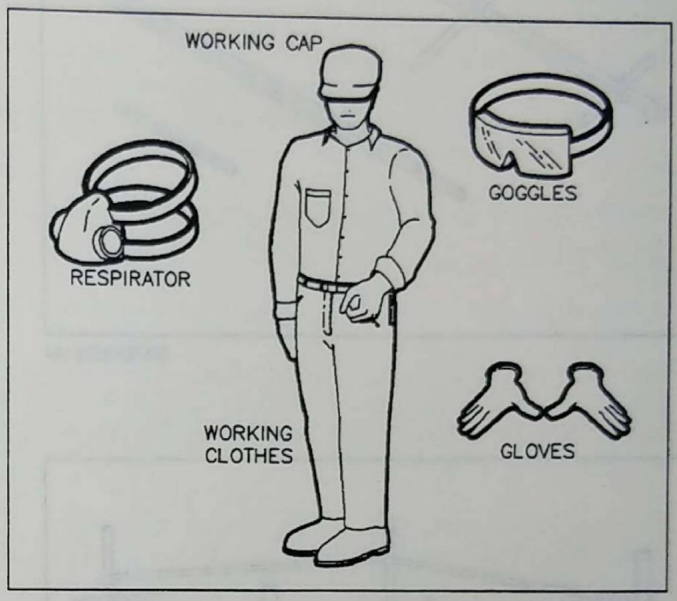
CAUTION: DISCONNECT THE HIGH VOLTAGE POWER SUPPLY WHEN ANY WELDING ON THE EVi IS PERFORMED. REFER TO “HIGH VOLTAGE DIS ABLE PROCEDURE” IN THIS MANUAL.

NOTICE: No specific number of spot welds will be given for a welding procedure. Make note of the number of welds when cutting out the damaged panels, and always duplicate the same number of factory welds.

N OTICE: Before welding make a series of test welds. For test welds use scrap of similar aluminum and cut and clamp in similar position to what you are welding. VNeld to achieve desired penetration and strength. Then test to insure desired strength is achieved. Adjust welder as necessary. Repeat weld test.

The plug welds used to repair the structure on an EVi are 10 mm (3/8 in.) plugweld holes. This will help ensure that proper penetration has been achieved and to make sure a cold weld hasn’t filled the void of the hole for the plug weld.

The repair procedures require the use of a metal-inert gas (MIG) welder. Gas (oxyacetylene) welding must not be used for welding, only for heating when it is Permitted. The MIG welder must have capabilities for aluminum welding, with correct wire for the particular uiaterial that you are working with. A Millermatic ^50-spool gun or equivalent in the 200 amp range should e satisfactory for most welding operations on an EVi.



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CORROSION PROTECTION AND SEALING

An important part of any damage repair is proper corrosion protection and sealing. Quality corrosion resistant coatings should be applied to all seams and weld joints. Proper application of seam sealers are important for water tightness and preventing water from entering into the passenger compartment, and any other areas that are considered to be dry areas of the vehicle such as the rear Apartment.

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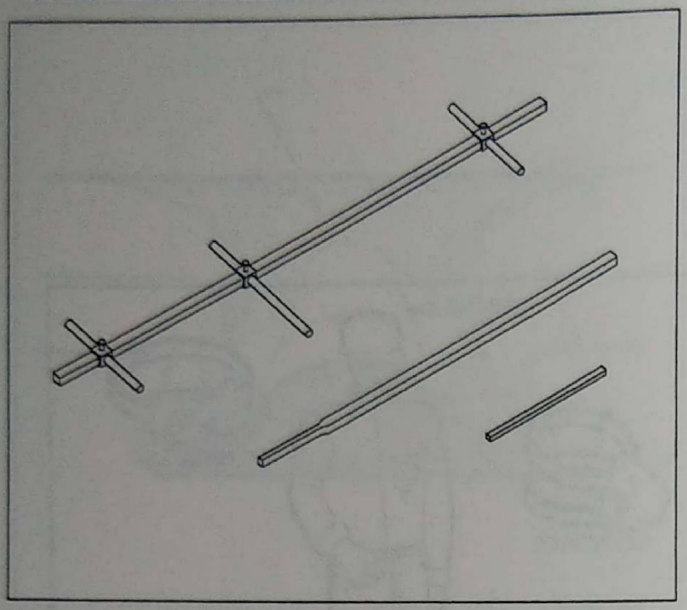
UNDERBODY

ALIGNMENT CHECKING

There are two types of dimension checking systems described in this section.

TWO DIMENSIONAL DISTANCE

This can be measured with the use of a tram bar, measuring the distance between two points on a horizontal plane or on a point-to-point dimension.



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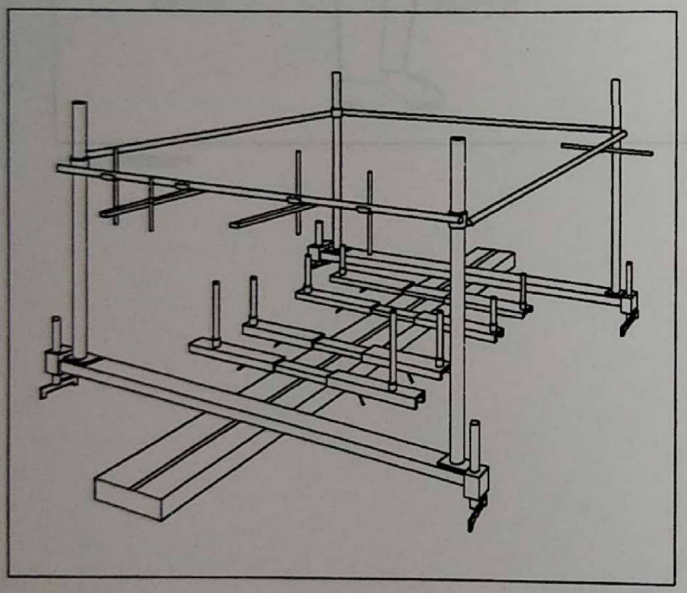
THREE DIMENSIONAL DISTANCE

This can be measured with the use of a universal measuring system capable of dimensioning the length width and height of a datum plane simultaneously. Three dimensional distances are used for both underbody and upperbody measuring.



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NOTES

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THREE DIMENSIONAL DISTANCE X, Y, Z

This can be measured with the use of a universal measuring system capable of dimensioning the length, width and height of a datum plane simultaneously. Three dimensional distances are used for both underbody and upperbody measuring.

X = Fore and aft measurements along the center line of the vehicle. An "O" plane is located forward of the master gauge hole at the front of the vehicle 1999.00 mm as shown. All measurements are made from this plane toward the rear of the vehicle.

Y = Cross car dimensions positive values are measured from the center of the ve^cle to the right side of the vehicle. Negative values are measured from the center of the vehicle to the left side. When values are not listed separately to change "hand" on the vehicle, you only need to change the "Y ' dimensions to the opposite value " "— or "+" from what is listed."

Z = Vertical measurement from the datum plane that is 309 mm below the rocker panel lower flange edge. ("0" plane.)

All dimensions are symmetrical unless otherwise noted.

For proper repair of the spaceframe it is necessary to restore the vehicle to these XYZ dimensions to which we build the vehicle to in the fixtures at the manufacturing plant. Relational (linear) dimensions are for reference only. They may be used for diagnose or checking only. Relational dimensions do not afford the accuracy that XYZ dimensions and measuring systems have.

The gage holes shown (highlighted with arrows) are the actual fixture locations that are used to build the vehicle in plant. When the vehicle is damaged to the point where less than three of these locations are in place, it would be wise to very accurately access damage to determine if the vehicle is actually economically repairable.

IMPORTANT: All dimensions are with mechanicals removed.

Dimensions from centerline are combined when equal. Divide by two for individual dimensions from centerline.

All dimensions are measured to center of hole unless otherwise described in *measuring point designation.*

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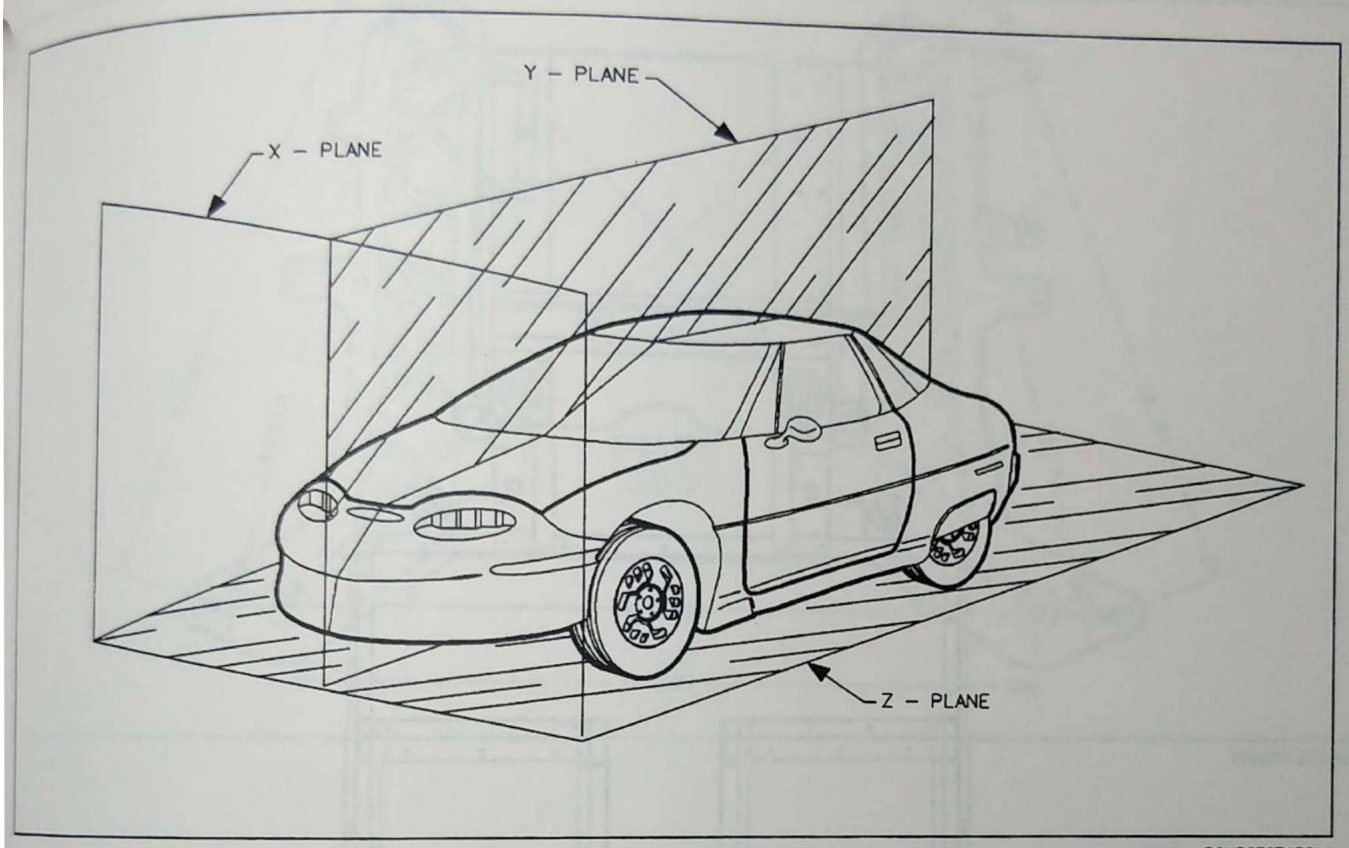
^DIMENSIONS



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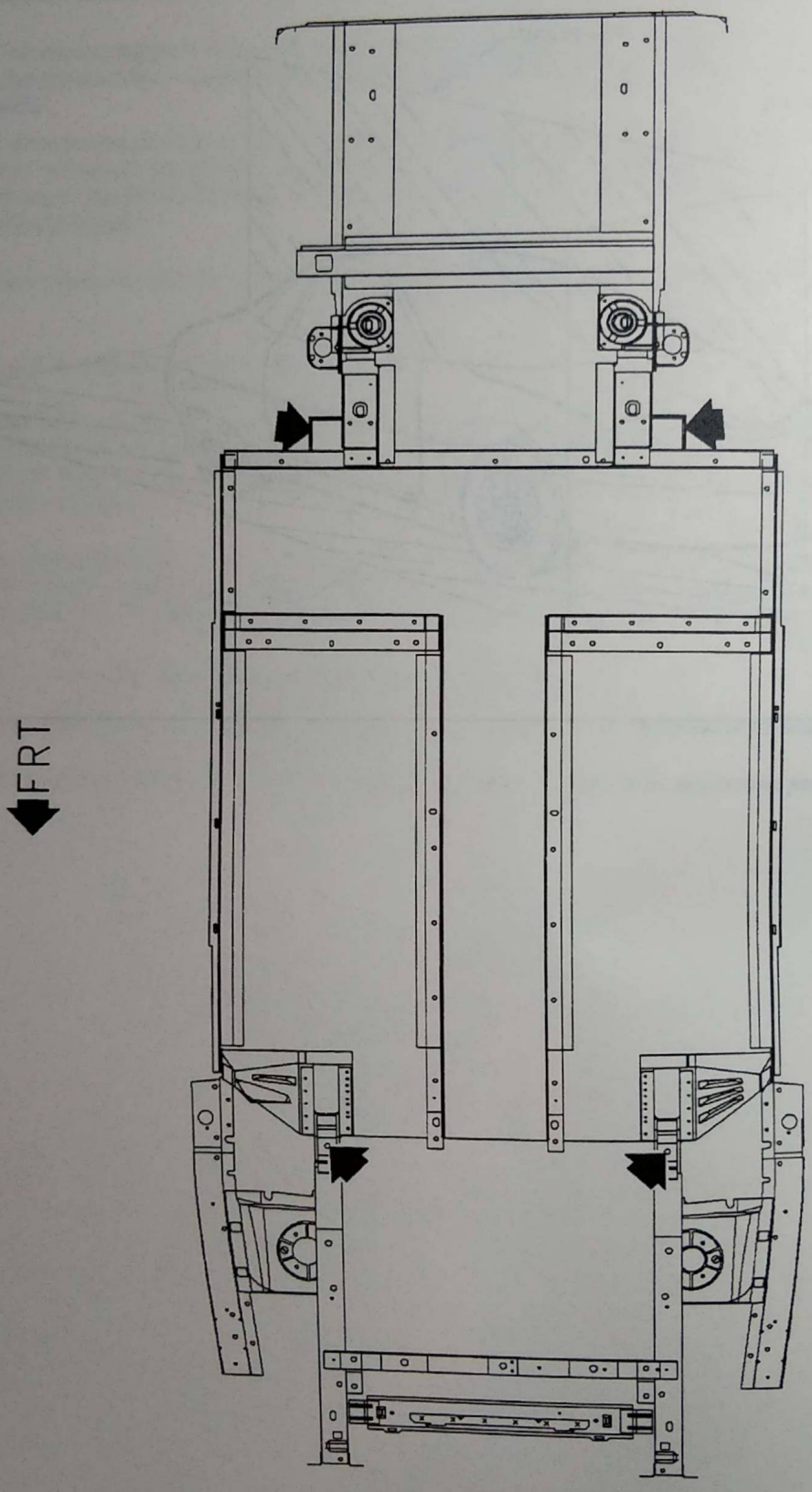
BODY DIMENSION DRAWINGS – EV1



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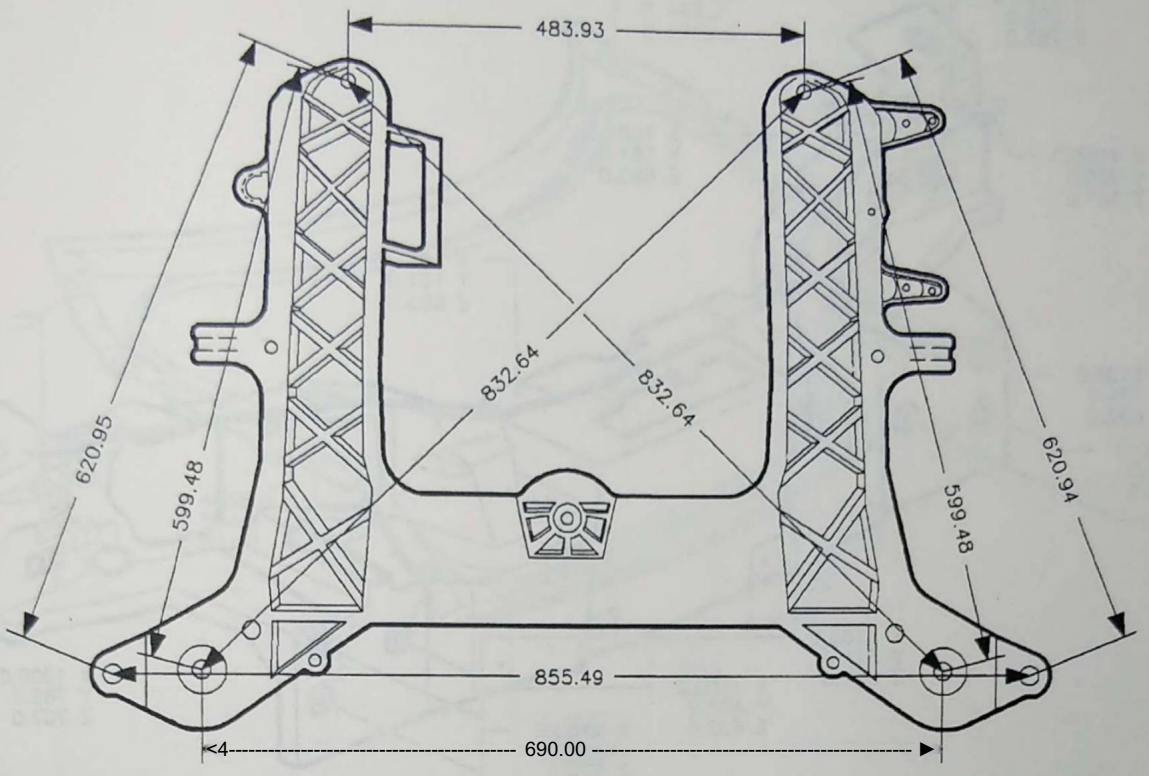

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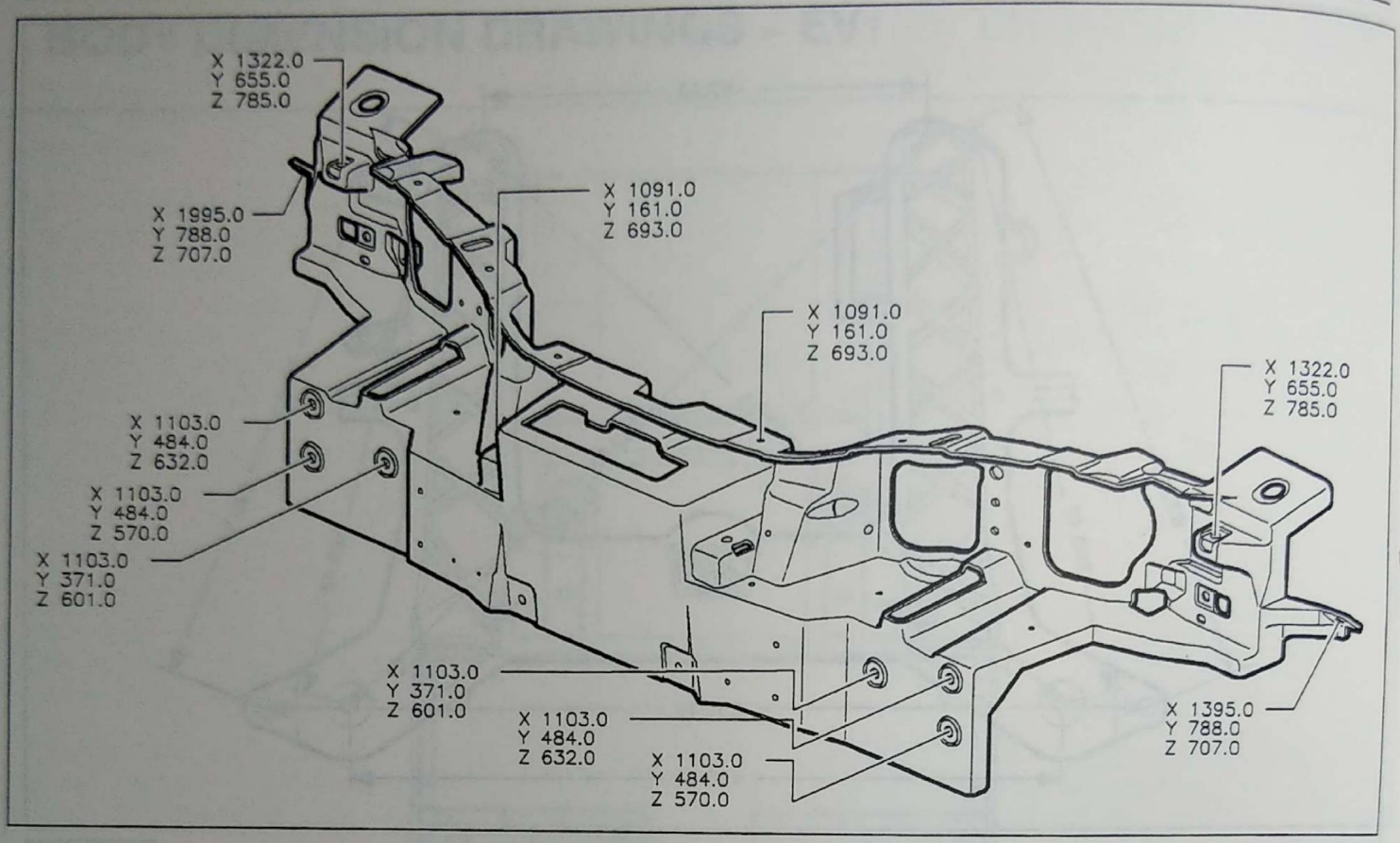

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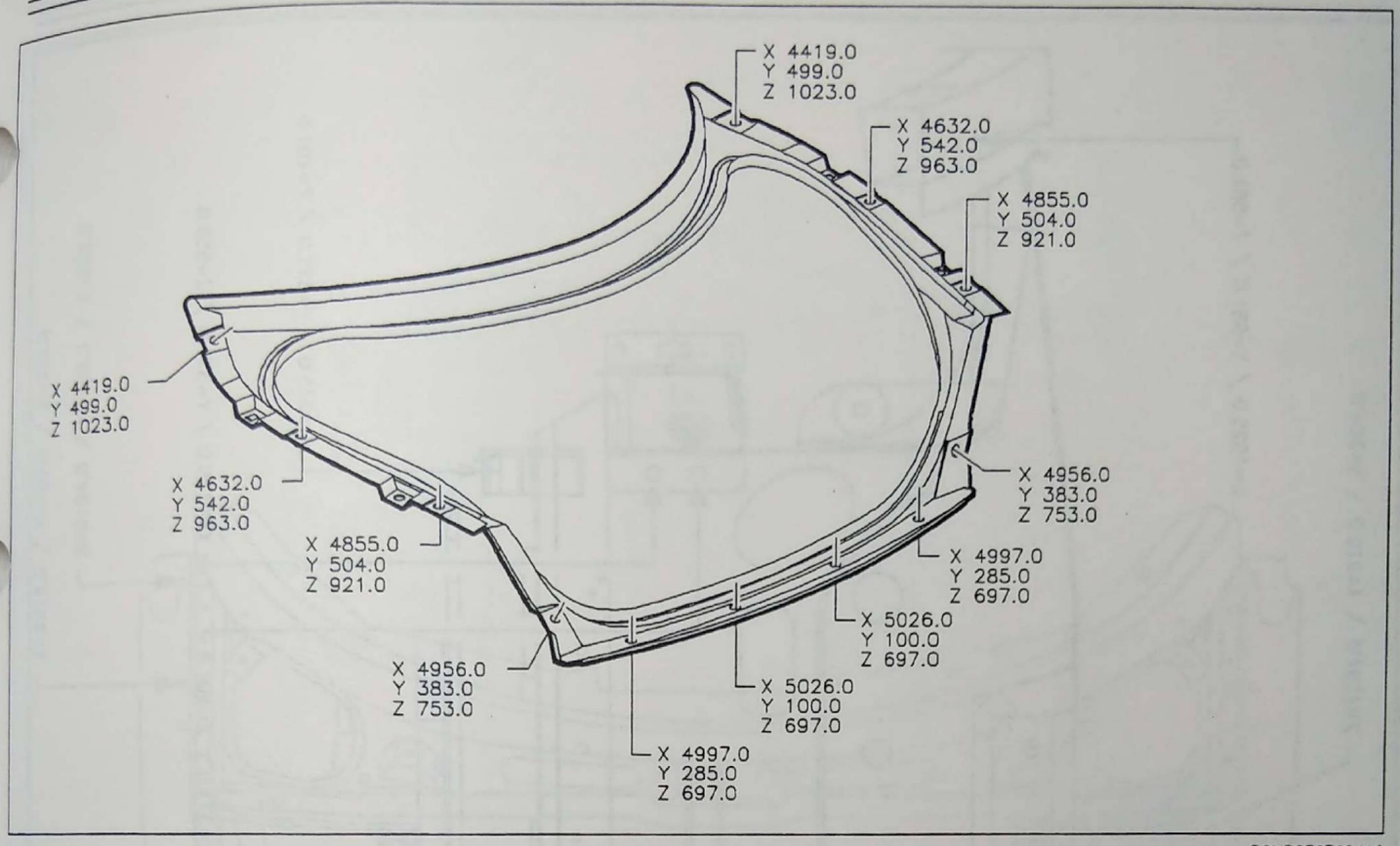

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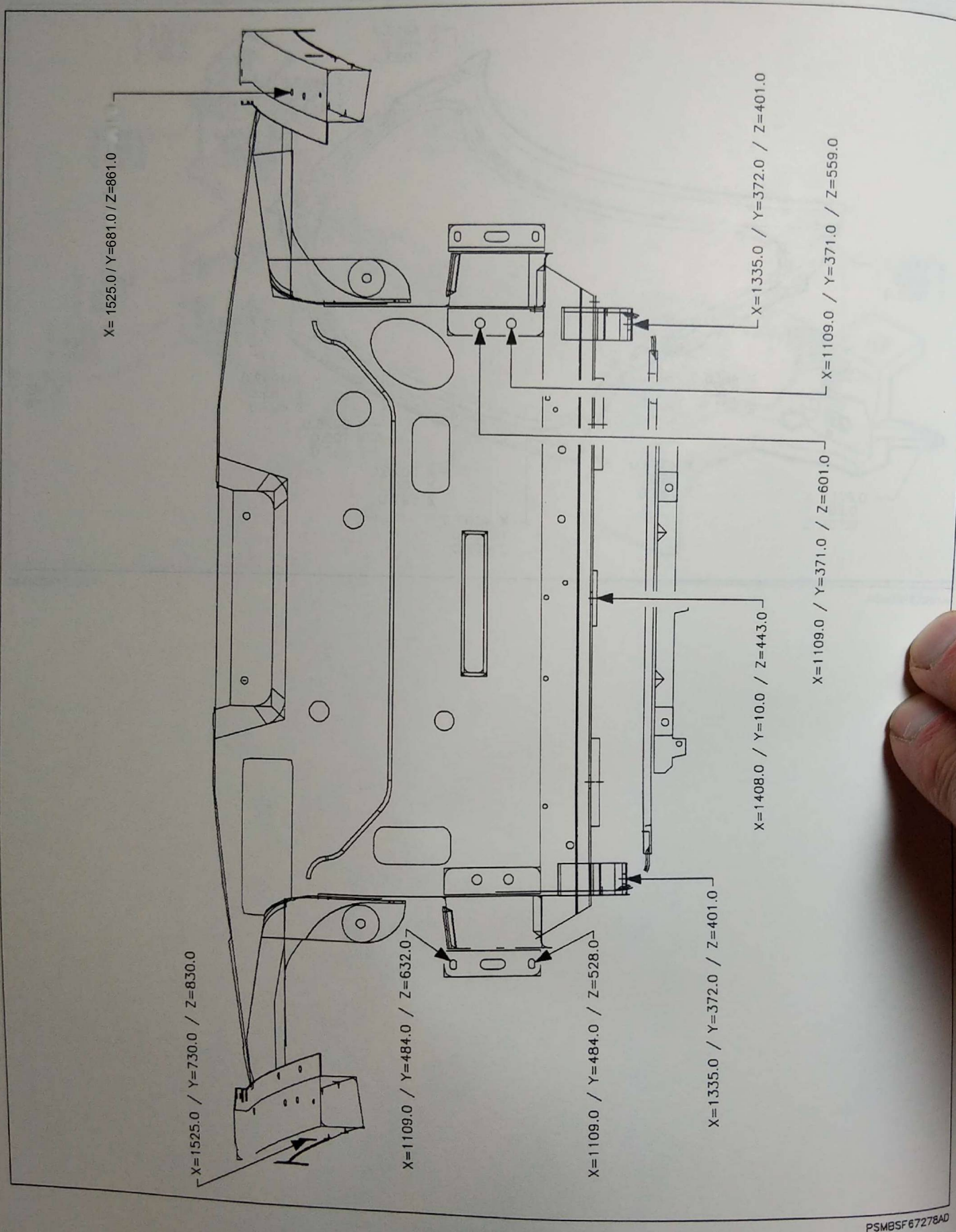
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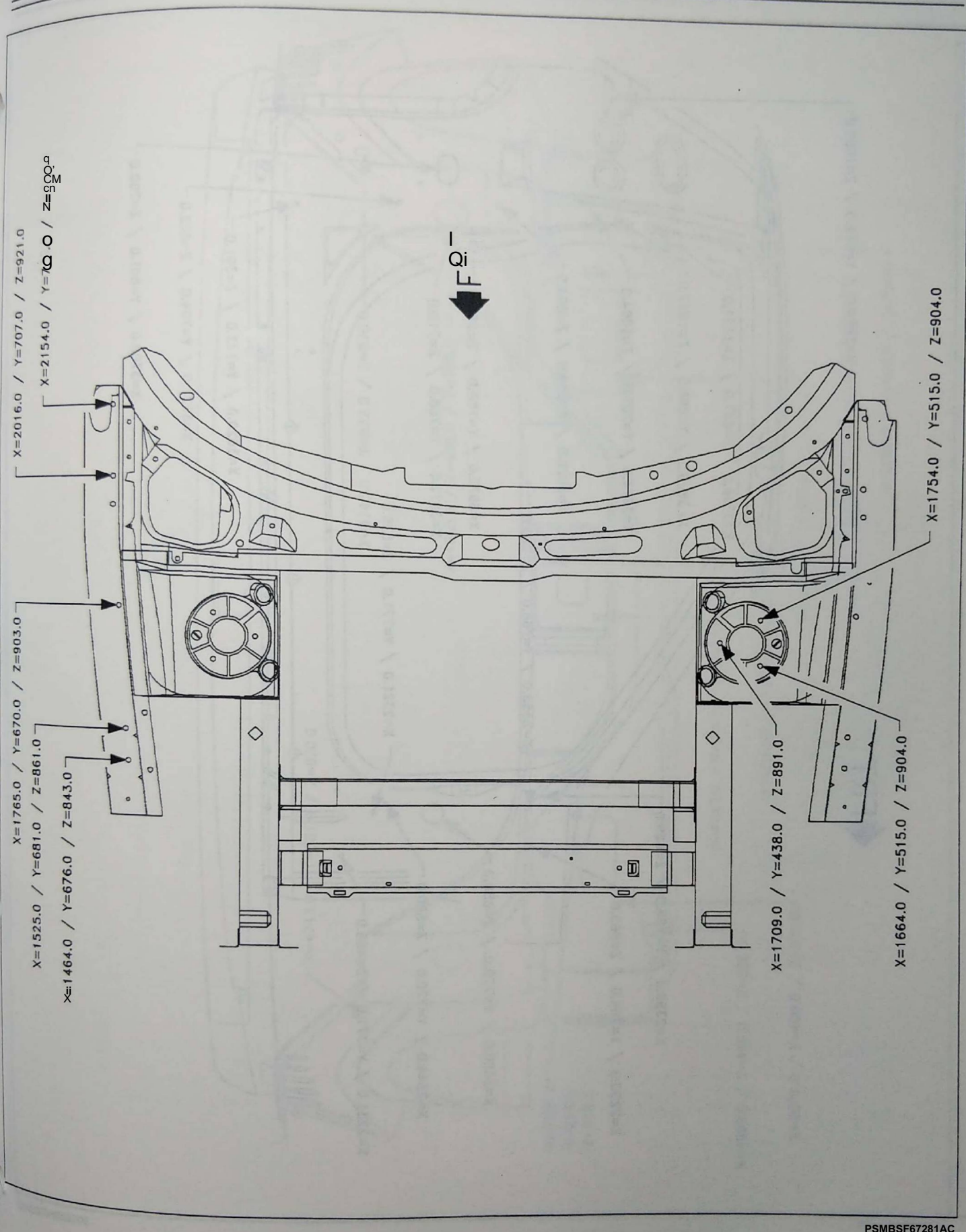

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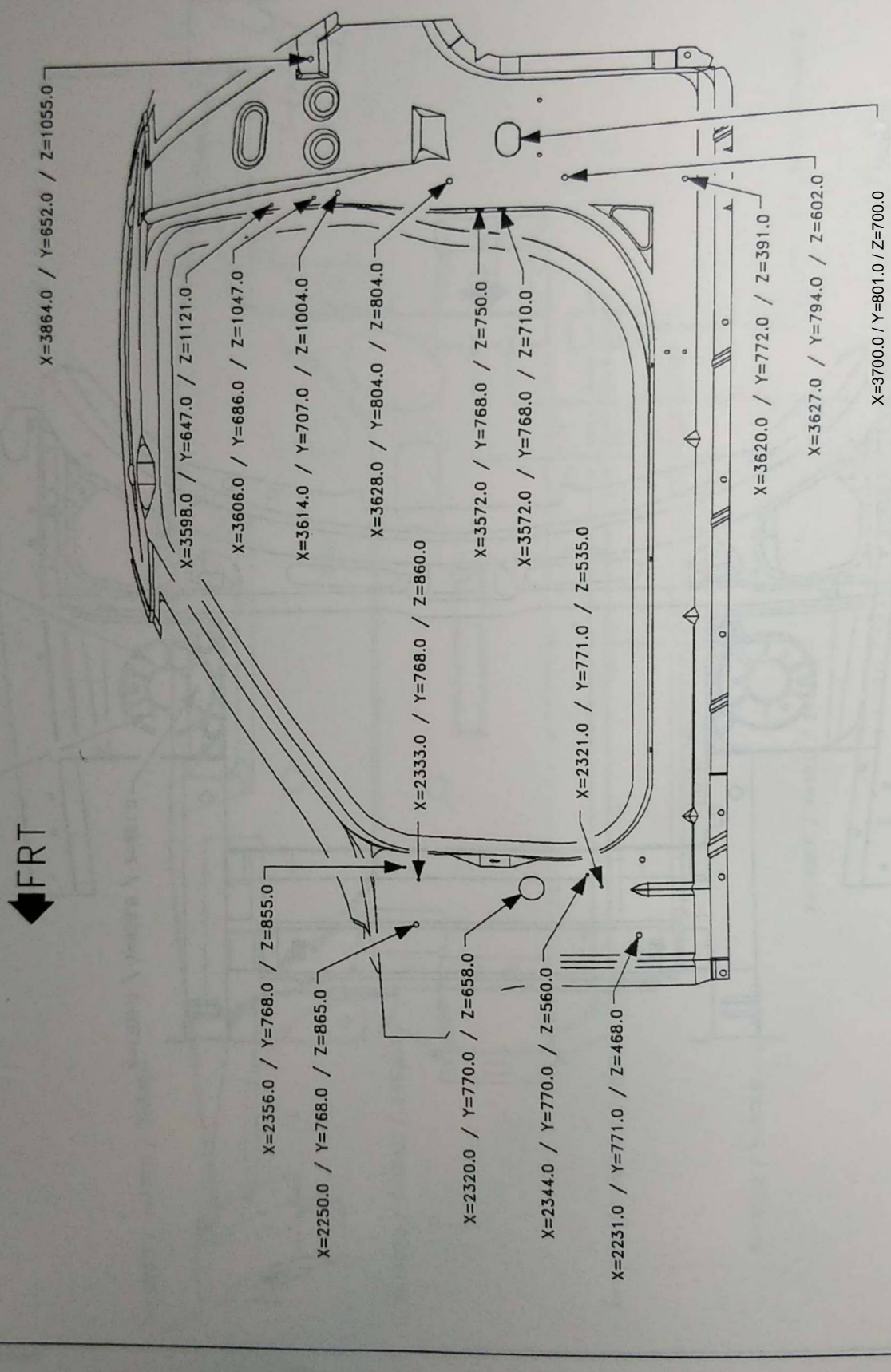

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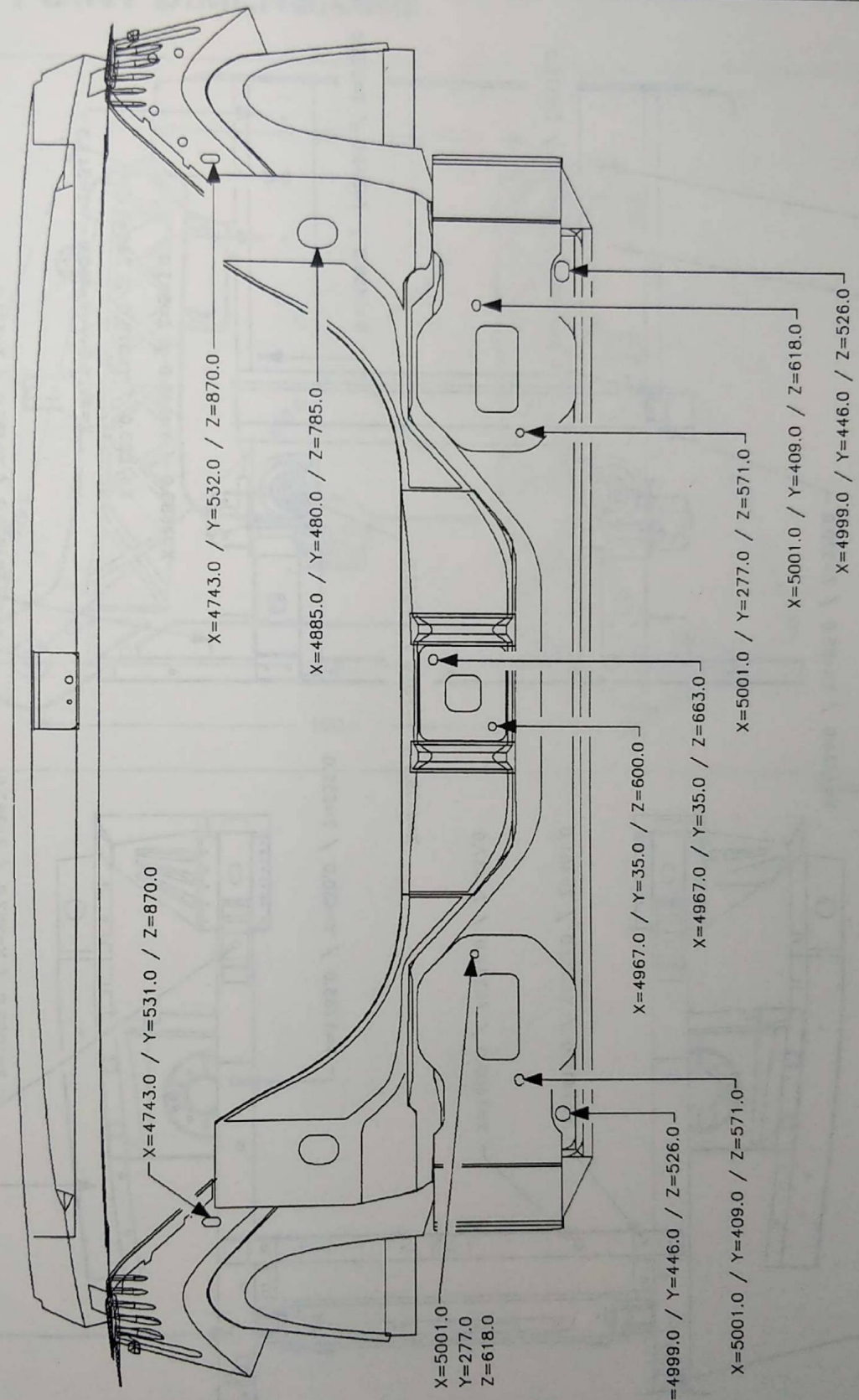

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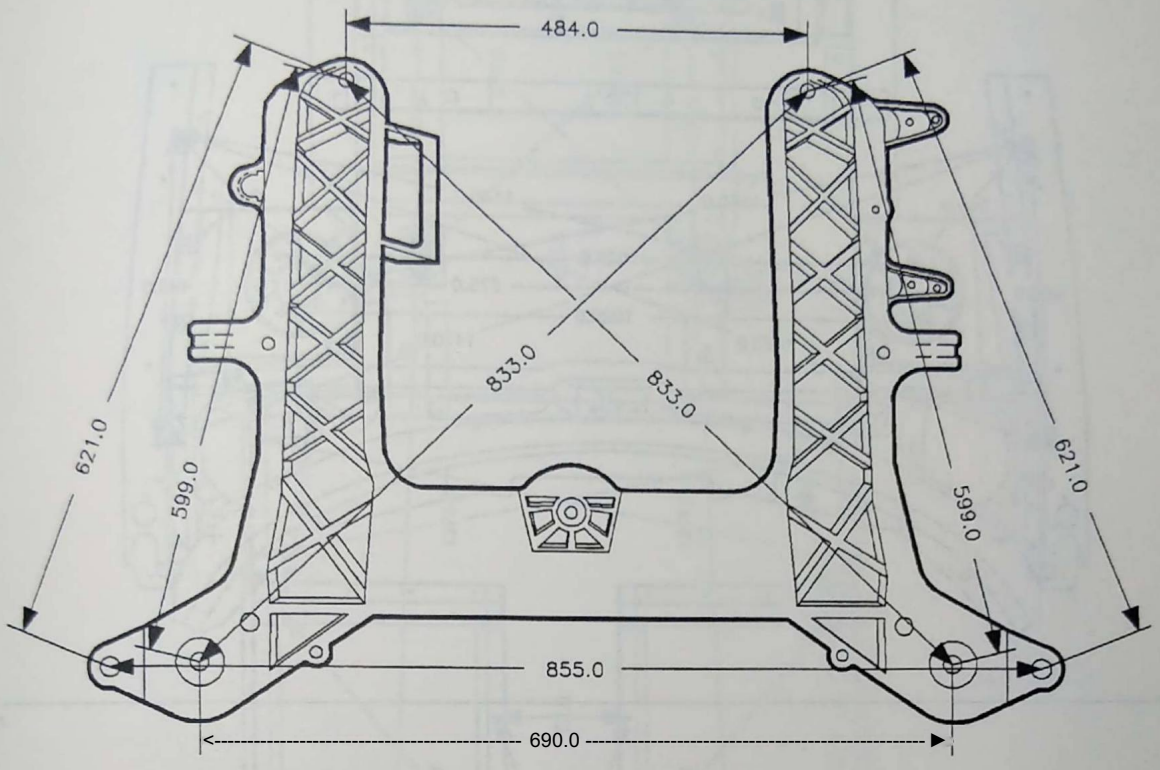
POINT–TO–POINT DIMENSIONS



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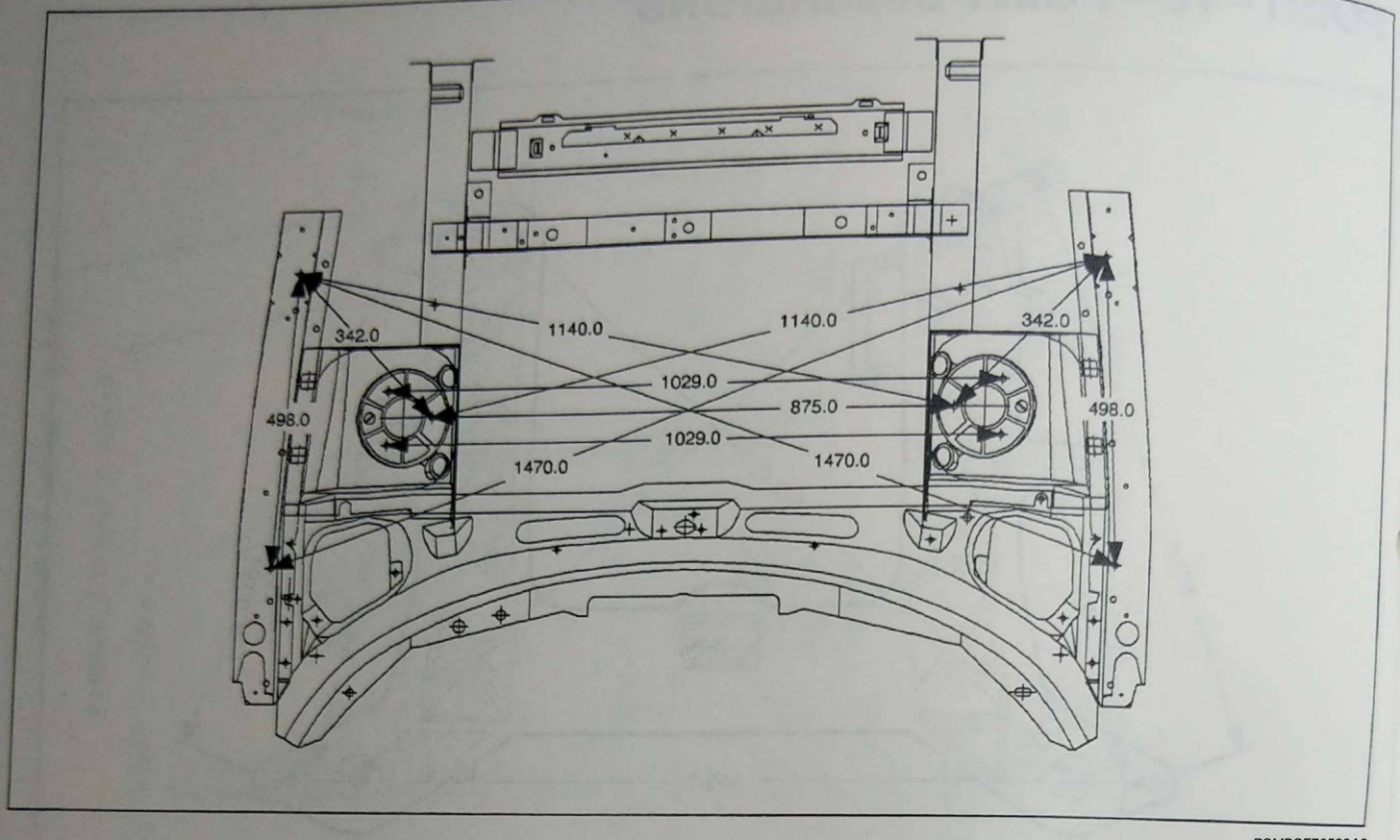

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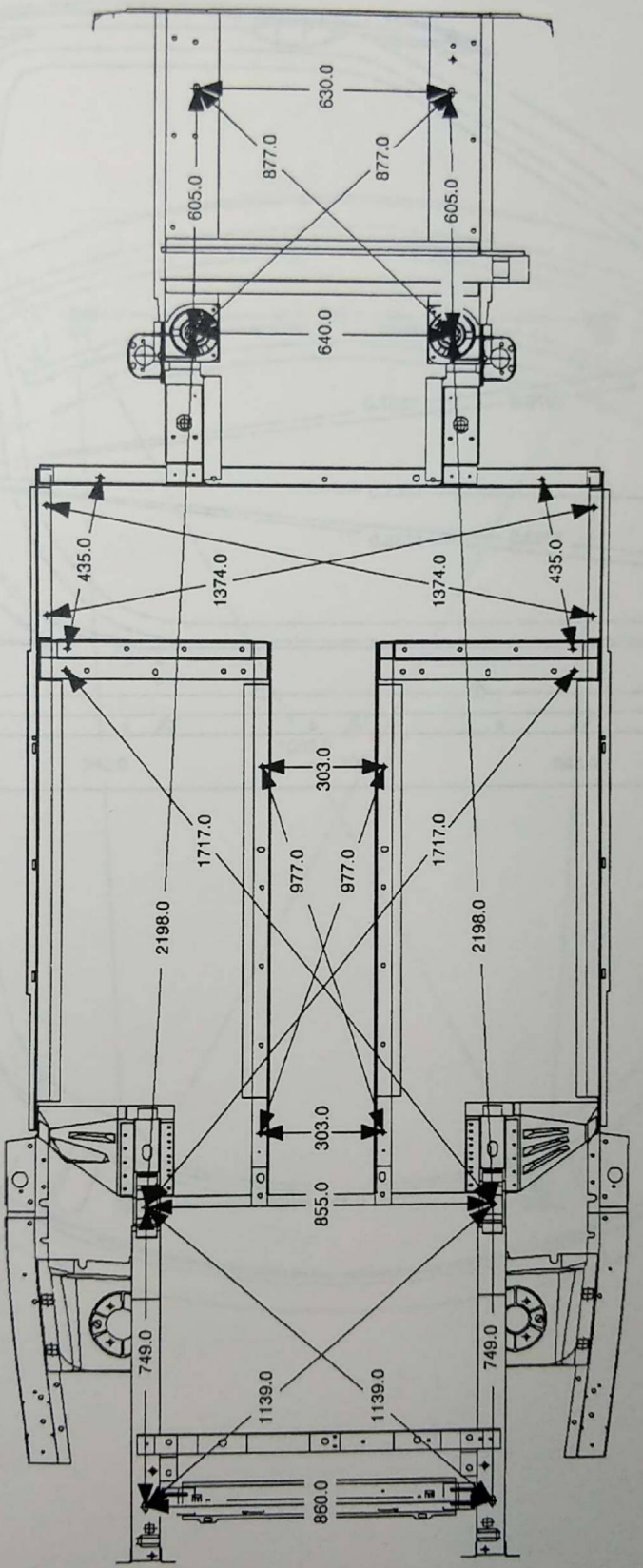

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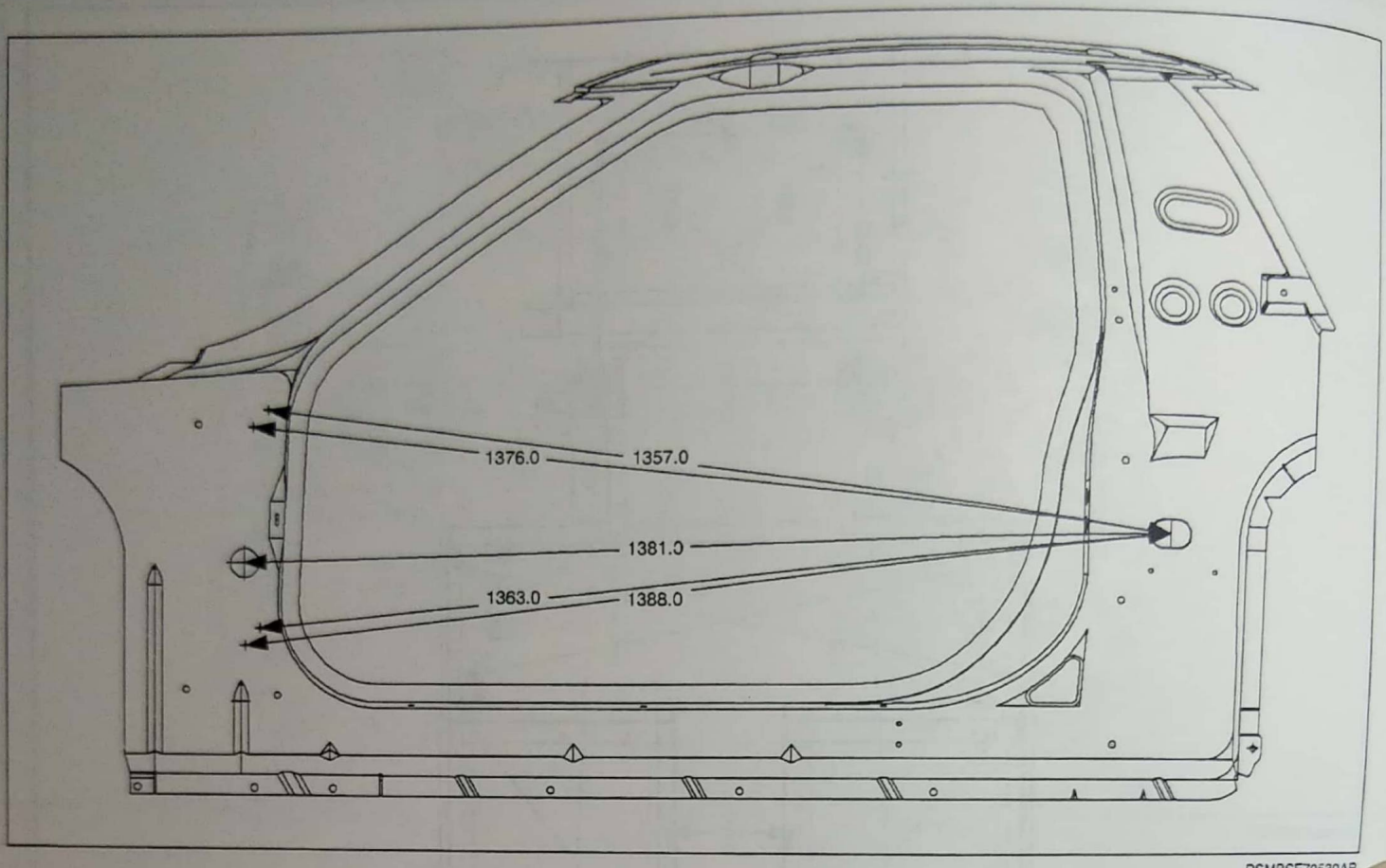

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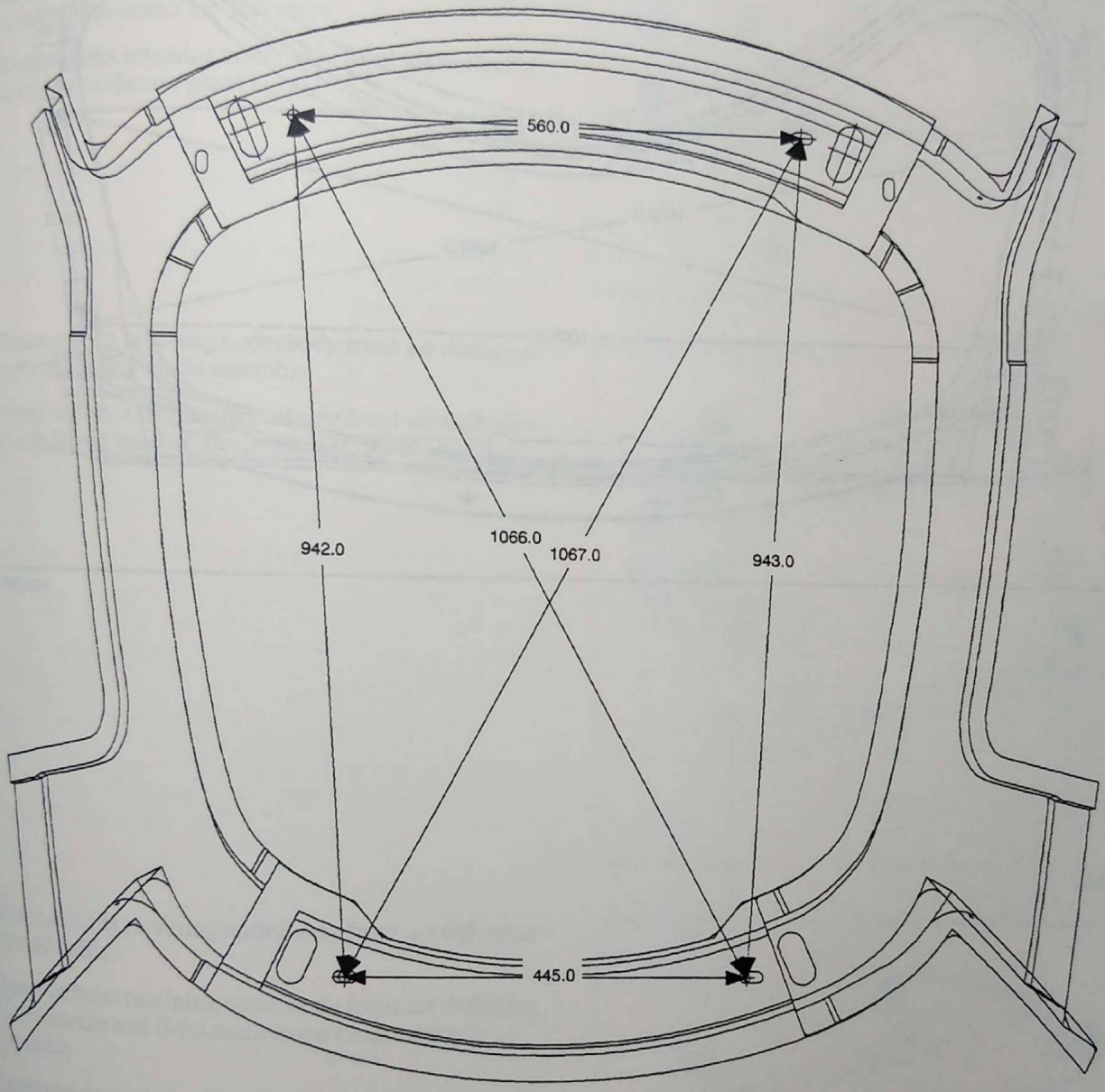

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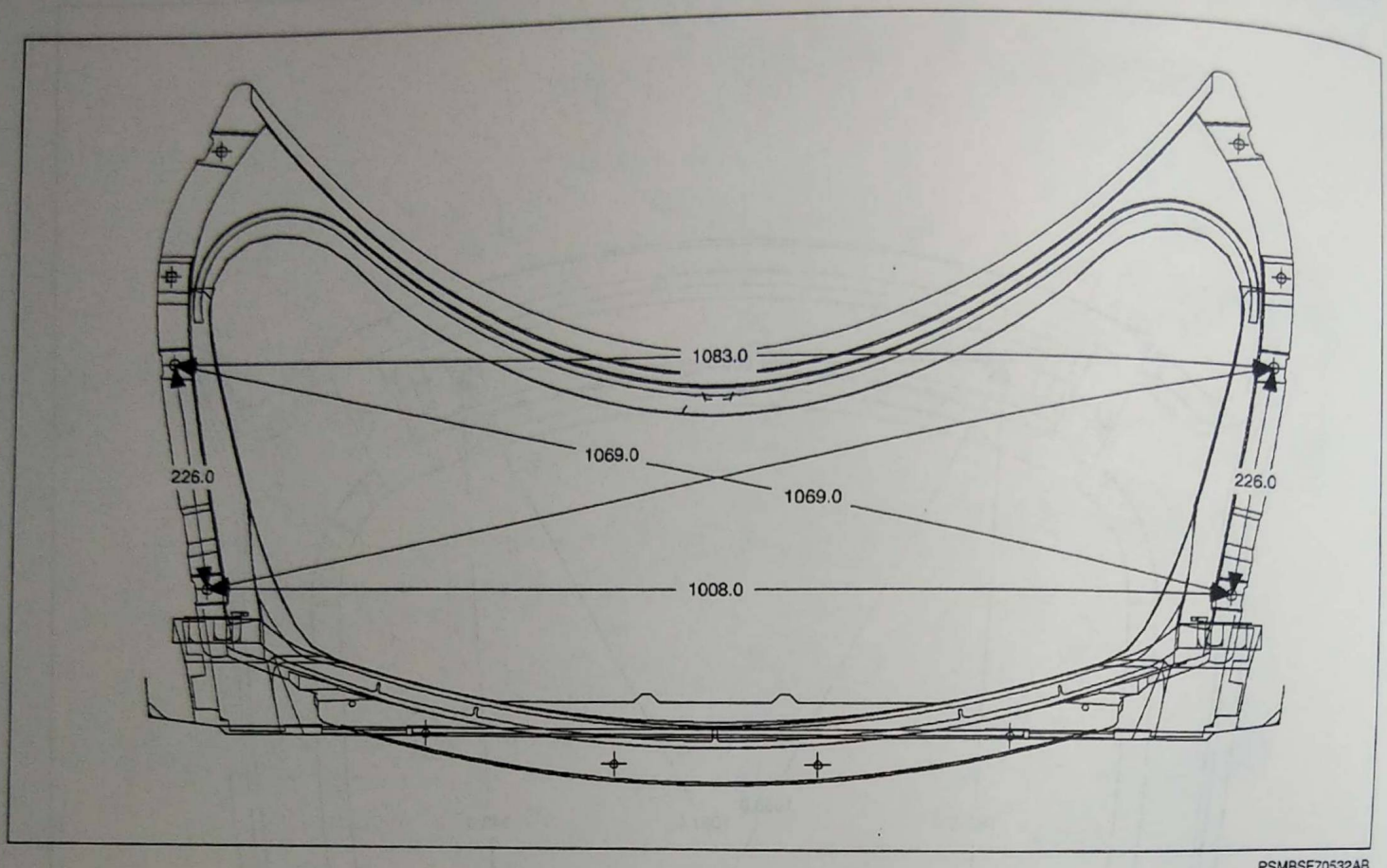

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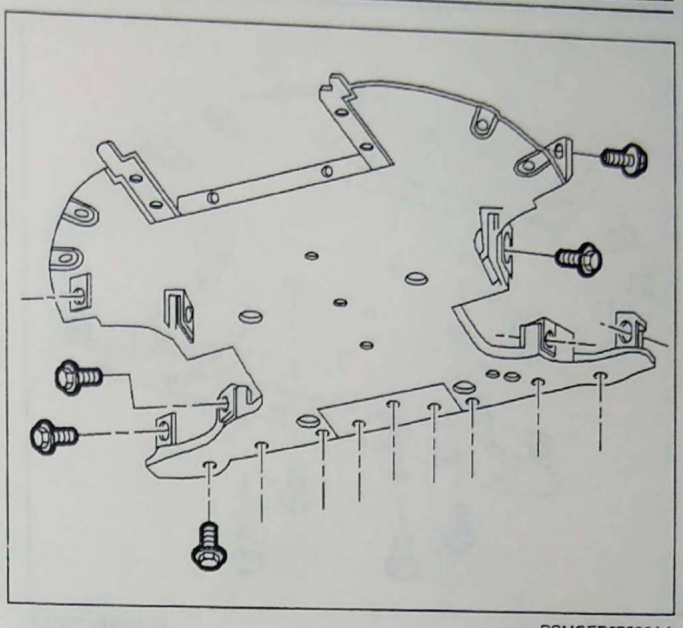
UNDERBODY FRONT AIR DEFLECTOR

□glVIOVAL

n ice vehicle on hoist. (Refer to "Lifting, Jacking, and 1 Support Points" section in this manual.)

Remove bolts retaining underbody front air deflector - * nderbodv center air deflectors.

• Remove bolts retaining underbody front air deflector t0 frOnt wheelhouse panel liners.



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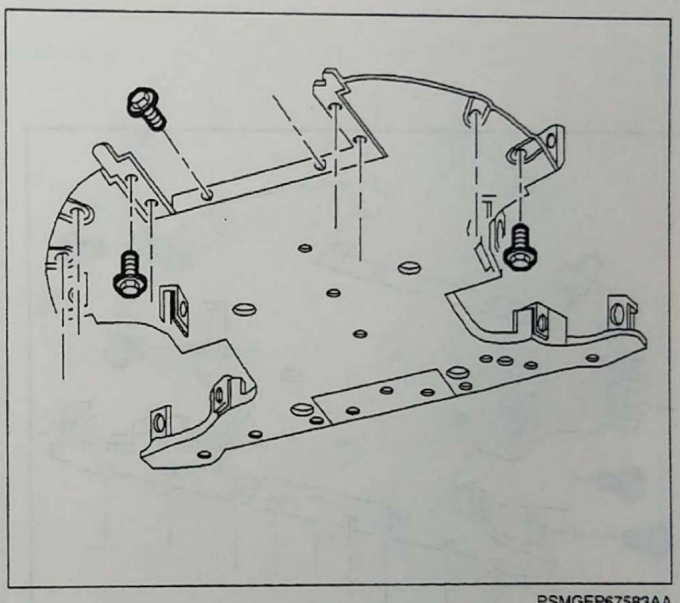
4. Remove bolts retaining underbody front air deflector to front bumper fascia assembly.

5. Remove bolts retaining underbody front air deflector to condenser radiator fan module (CRFM) bracket.



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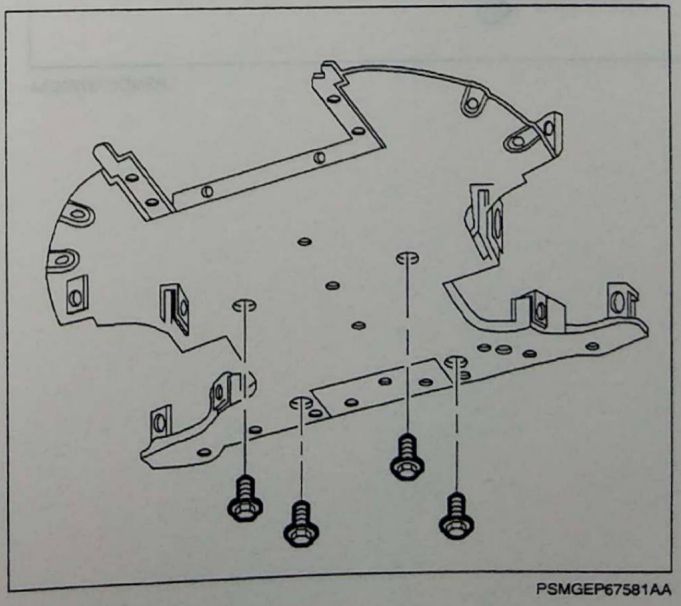
6. Remove bolts retaining underbody front air deflector 10 side baffles.

7. Remove b°ltS reta^n^n8 underbody front air deflector assemb*l"**rr ArOnt susPens*on crossmember

8. Lower underbody front air deflector and disengage tabs from front bumiper fascia assembly.



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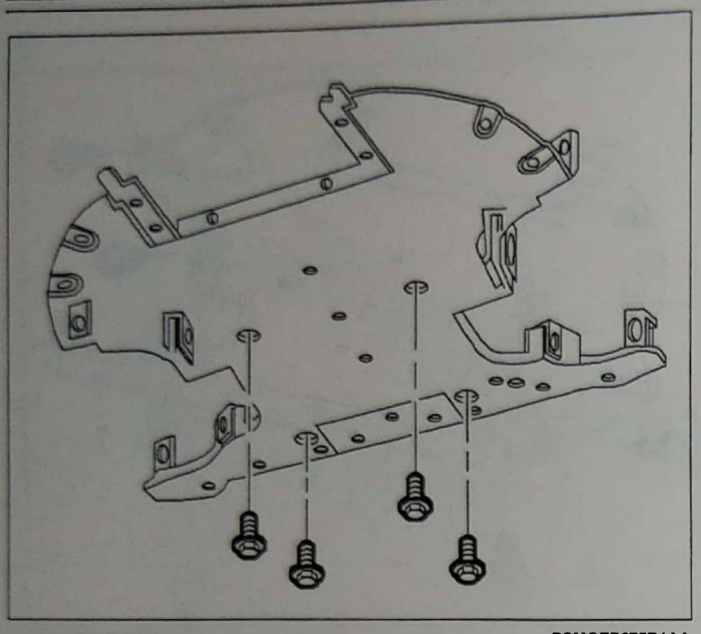

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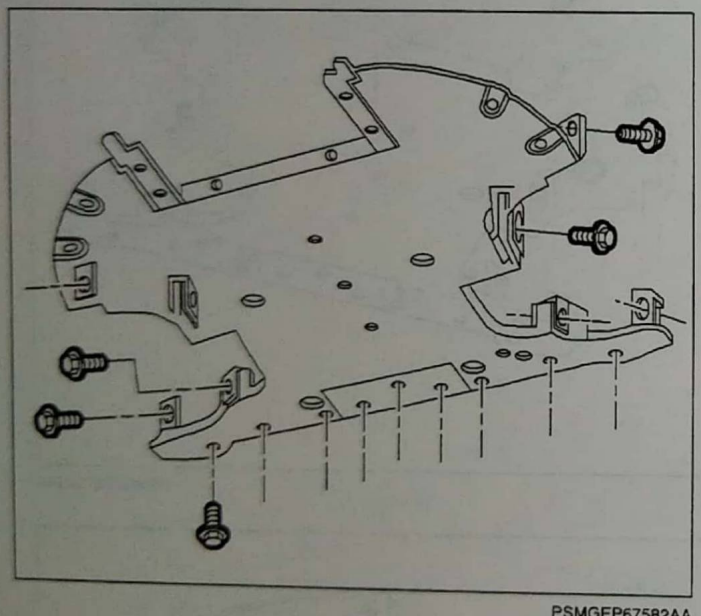

PSMGEP67582AA

INSTALLATION

IMPORTANT: If bolt threads or "J" nuts threads a damaged during removal or installation, remove bolr fastener, inspect, and replace if necessary.

1. Raise front edge of air deflector and engage tabs retaining slots on front bumper fascia assembly
2. Raise and support underbody front air deflector to underside of vehicle.

IMPORTANT: Flange on air deflector must be located forward of condenser radiator fan module (CRFM) bracket.

3. Loosely install bolt retaining air deflector to CRFM bracket.
4. Loosely install bolts retaining underbody front air deflector to front mounting locations of drivetrain and front suspension crossmember assembly.
5. Loosely install bolts retaining underbody front air deflector to rear mounting locations of drivetrain and front suspension crossmember assembly.
6. Install and tighten bolts retaining underbody front air deflector to underbody center air deflectors. Torque as specified.

Torque: 6 N*m (53 in-Ibs)

IMPORTANT: If cradle bolt begins to cross thread during installation, stop immediately, remove bolt, then run thread tap (M6.0 mm x 1.0) into insert to repair . damaged threads.

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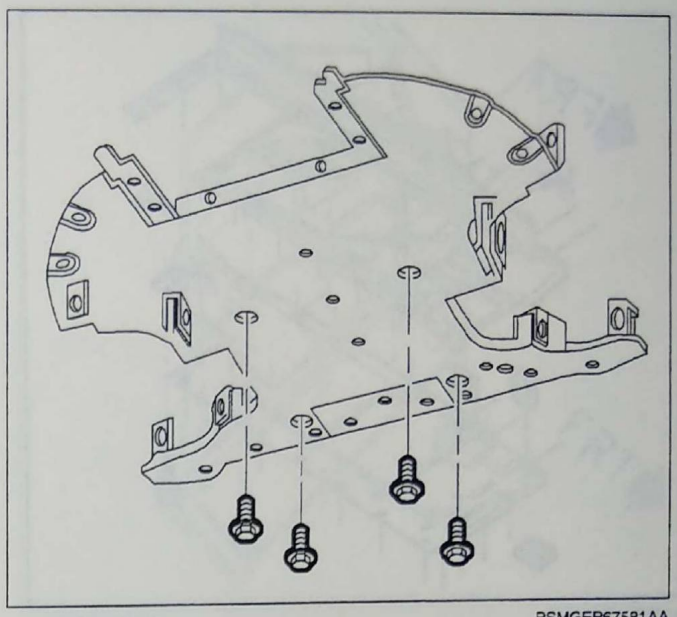
7. *Tighten bolts retaining underbody* front air deflector to front mounting locations of drivetrain and front suspension crossmember assembly. Torque as *specified.*

*Torque: 6 N*m (53 in-lbs)*



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IMPORTANT: At CRFM attachment, position air deflector flange so that it rests up against the bottom of the CRFM lower support.

8. Install and tighten bolt retaining underbody front air deflector to CRFM bracket. Torque as specified.

Torque: 6 N*m (53 in-lbs)

9. Tighten remaining bolt retaining air deflector to CRFM bracket. Ensure underbody front air deflector is up against bottom of CRFM lower support. Torque as specified.

Torque: 6 N*m (53 in-lbs)

10. Install and tighten bolts retaining underbody front air deflector to CRFM to fascia close-out side baffles. Torque as specified.

Torque: 6 N*m (53 in-lbs)

11. Install and tighten bolts retaining underbody front air deflector to front bumper fascia assembly. Torque as specified.

Torque: 6 N*m (53 in-lbs)

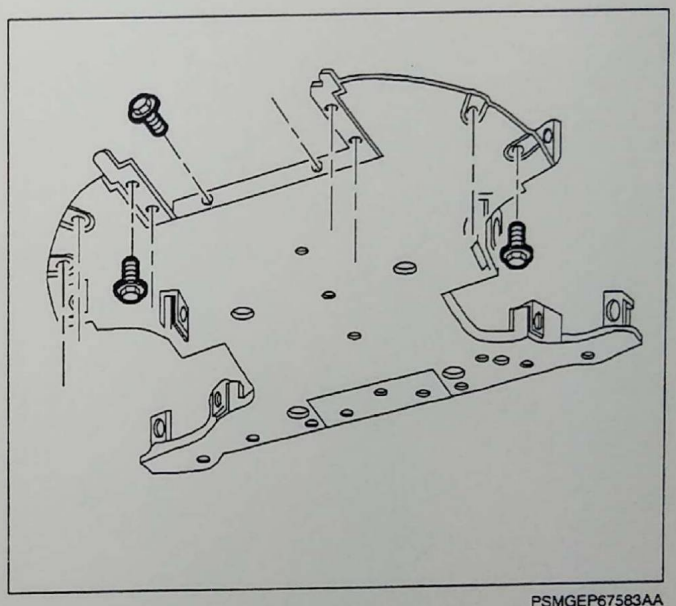
12. Install and tighten bolts retaining underbody front air deflector to front wheelhouse panel liner on one side of the vehicle. Front tires may need to be turned to access mounting locations. Torque as specified.

Torque: 6 N*m (53 in-lbs)

13. Install and tighten bolts retaining underbody front air deflector to front wheelhouse panel liner on opposite side of the vehicle. Front tires may need to be turned to access mounting locations. Torque as specified.

Torque: 6 N*m (53 in-lbs)

14. Lower vehicle and turn front wheels to face in a straight ahead position.



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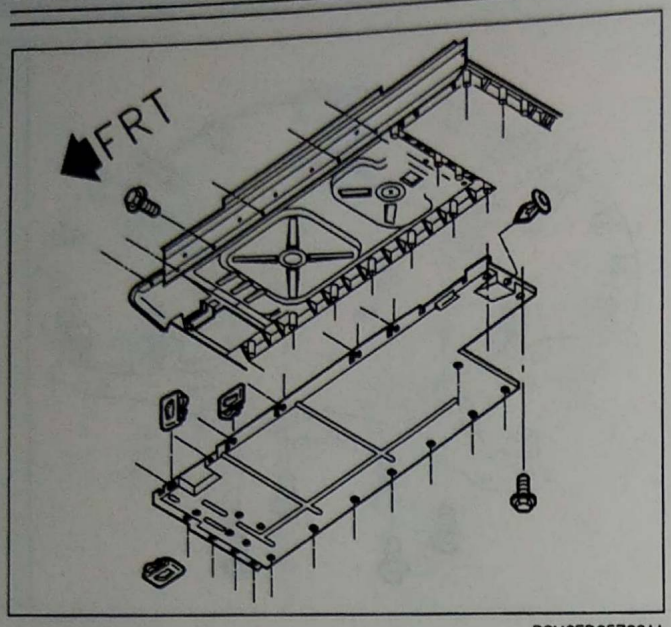

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UNDERBODY CENTER AIR DEFLECTORS

REMOVAL (LEFT OR RIGHT SIDE)

1. Raise vehicle on hoist. (Refer to "Lifting Jack Support Points" section in this manual.) '
2. Remove bolts retaining underbody front air defl to underbody center air deflector.
3. Remove bolts from trap door location on front underbody air deflector.
4. Remove bolts retaining underbody center air deflector to rocker outer finish panel.
5. Remove bolt retaining underbody center air deflector to front fender.
6. Remove bolts retaining center air deflector to battery pack tray.
7. Lower and remove underbody center air deflector from vehicle.

INSTALLATION

IMPORTANT: If bolt threads or "J" nuts threads are damaged during installation, remove bolt and fastener, inspect, and replace if necessary.

1. Raise and support underbody center air deflector to underside of vehicle.
2. Install front edge of underbody center air deflector above rear edge of underbody front air deflector.
3. Loose install bolts retaining underbody center air deflector to underbody front air deflector.
4. Loose install bolts retaining underbody center air deflector to trap door location.

IMPORTANT: If bolt begins to cross thread during installation in the battery tray, stop immediately, remove bolt, then run thread tap (M6.0 mm x 1.0) into insert to repair damaged threads.

5. Loose install bolts retaining underbody center air deflector to battery pack tray.
6. Check and align rocker outer finish panel to lower edge. Install bolts retaining underbody ce air deflector to rocker outer finish panel. Torq specified.

Torque: 6 N'm (53 in-lbs)

7- Torque all remaining bolts as specified.

Torque: 6 N*m (53 in-lbs)

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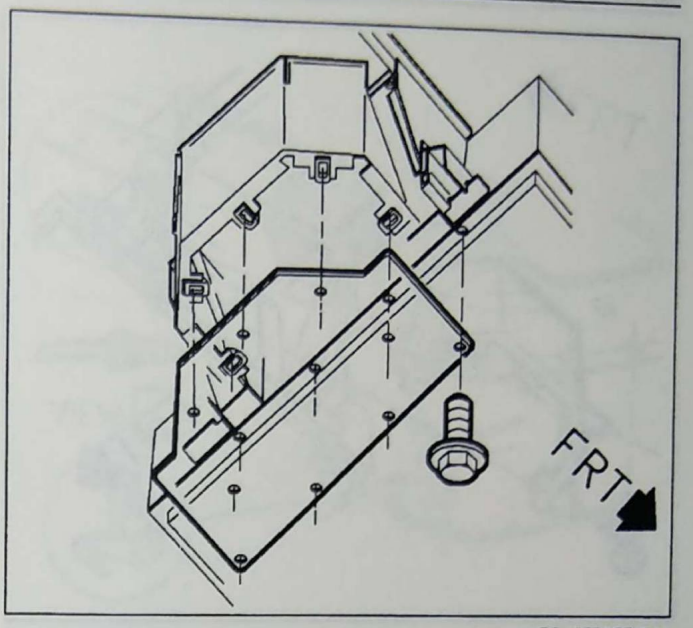
DERBODY CENTER REAR AIR ^LECTOR



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REMOVAL

n.ke vehicle on hoist. (Refer to "Lifting, Jacking, and
1- $_{u}$pp$_{Or}$t Points" section in this manual.)

Remove bolts retaining underbody center rear air
2 deflector from battery pack tray.

„ RemOve bolts retaining underbody center rear air
? deflector to underbody center air deflector bracket.

4. Lower and remove underbody center rear air deflector from vehicle.

INSTALLATION

1 Raise and support underbody center rear air deflector to underbody center rear air deflector bracket assembly.

IMPORTANT: If bolt begins to cross thread during installation in the battery tray, stop immediately, remove bolt, then run thread tap (M6.0 mm x 1.0) into insert to repair damaged threads.

2. Loose install bolts retaining underbody center rear air deflector to battery pack tray.

IMPORTANT: If bolt threads or "J" nuts threads are damaged during installation, remove bolt and fastener, inspect, and replace if necessary.

3. Install bolts retaining underbody center rear air deflector to underbody center air deflector bracket assembly. Torque as specified.

Torque: 6 N*m (53 in-lbs)

4- Torque all remaining bolts as specified.

Torque: 6 N.$_{m}$ (53 in-lbs)

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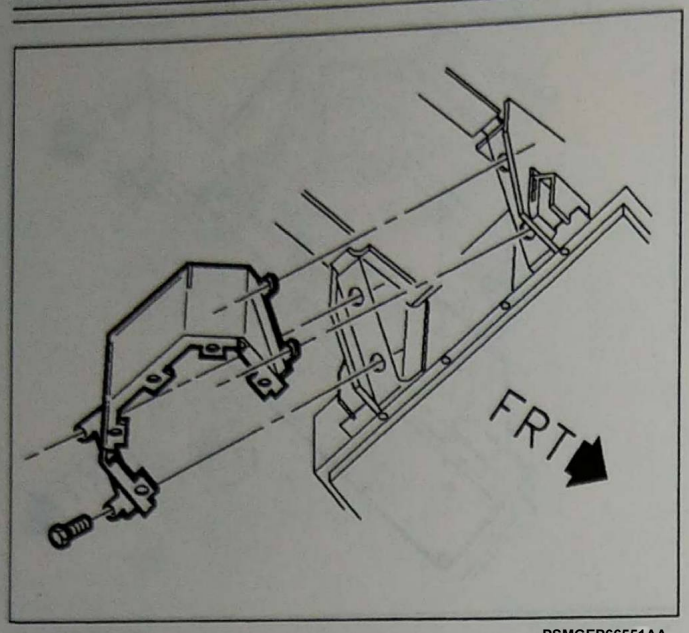

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UNDERBODY CENTER REAR A,N DEFLECTOR BRACKET ASSEMBLY

REMOVAL

1. Raise vehicle on hoist. (Refer to "Lifting Ja Support Points" section in this manual.) Ckln& and
2. Remove bolts retaining underbody center re deflector from battery pack tray. Cdr air
3. Remove bolts retaining underbody center rear' deflector to underbody center air deflector brad- assembly. cket
4. Lower and remove underbody center rear air deflector from vehicle.
5. Remove bolts retaining underbody center rear air deflector bracket assembly to vehicle underside.
6. Lower and remove bracket from vehicle.

INSTALLATION

1. Raise and support underbody center rear air deflector bracket assembly to underside of vehicle.
2. Install bolts retaining underbody center rear air deflector bracket assembly to vehicle. Torque as specified.

Torque: 6 N*m (53 in-lbs)

3. Raise and support underbody center rear air deflector to center air deflector bracket assembly.

IMPORTANT: If bolt threads or "J" nuts threads are damaged during installation, remove bolt and fastener, inspect, and replace if necessary.

4. Loose install bolts retaining underbody center rear air deflector to underbody rear air deflector bracket assembly.

IMPORTANT: If bolt begins to cross thread during installation in the battery tray, stop immediately.reca ove bolt, then run thread tap (M6.0 mm x 1.0) into inser t to repair damaged threads.

5. Install bolts retaining underbody centerrear air deflector to battery pack tray. Torque as spe cified.

Torque: 6 N*m (53 in-lbs)

6. Torque all remaining bolts as specified.

Torque: 6 Nem (53 in-lbs)

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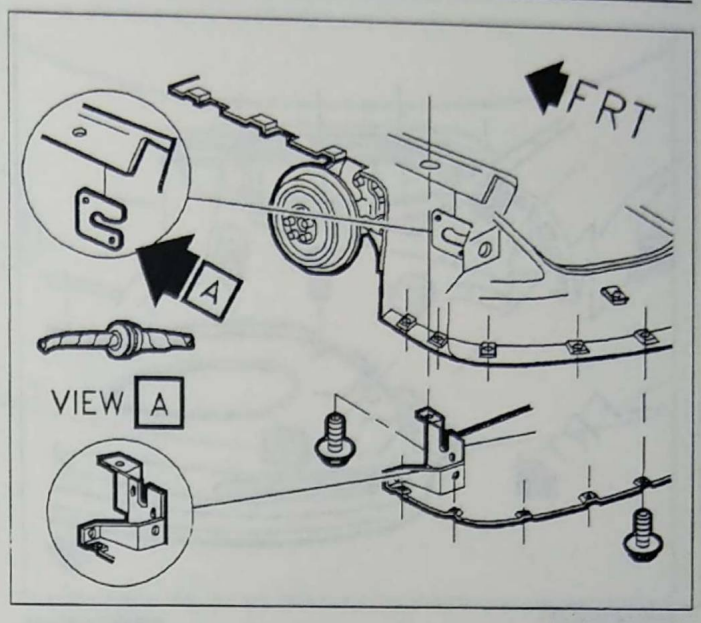
UNDERBODY REAR AIR PEFLECTOR



PSMGEP55705AC

pgMOVAL

Raise vehicle on hoist. (Refer to "Lifting, Jacking, and L SupPort Points" section in this manual)

2. Remove bolts retaining underbody rear air deflector to *ear bumper fascia assembly.

; Remove bolts retaining underbody rear air deflector to rear rails.

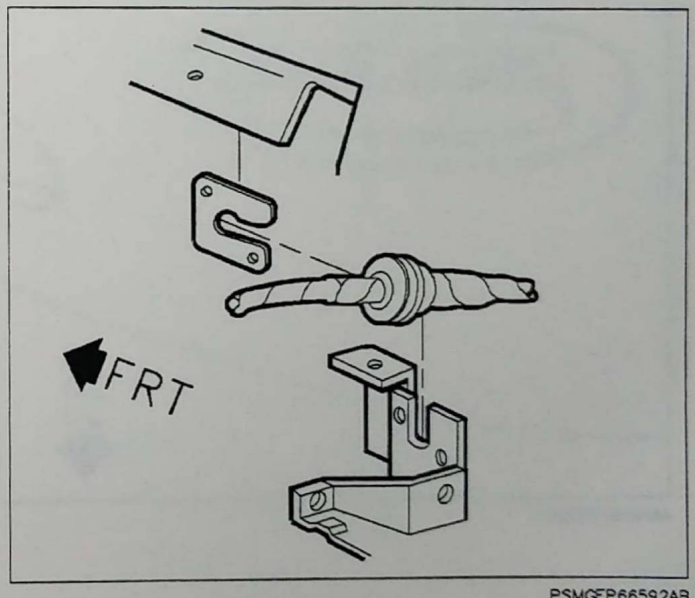
4. Remove fasteners four per side retaining underbody rear air deflector to rear wheelhouse panel liners.

- Retainers at rear of wheelhouse liner.
- Retainers in wheelhouse liner at each side of anti-lock braking system (ABS) wiring grommet.

5. Remove bolts retaining underbody rear air deflector to rear quarter outer panels.

6. Lower and remove underbody rear air deflector from vehicle.

INSTALLATION



PSMGEP66592AB

1. Install bolts retaining underbody rear air deflector to rear rails. Torque as specified.

Torque: 6 N*m (53 in-lbs)

IMPORTANT: If bolt threads or "J" nuts threads are damaged during installation, remove bolt and fastener, inspect, and replace if necessary.

2. Install bolts retaining underbody rear air deflector to rear quarter outer panels. Torque as specified.

Torque: 6 N*m (53 in-lbs)

3. Install retainers per side retaining underbody rear air deflector to rear wheelhouse panel liners.

- Retainers at rear of wheelhouse liner.
- Retainers in wheelhouse liner at each side of ABS wiring grommet.

NOTICE: Lnderbody rear air deflector must be install ,d ;nboar d of rear wheelhouse panel liner and Corr ectly Seate d aroun d wiring grommet for proper water *deflect* **don.**

IMPORTANT: If bolt threads or "J" nuts threads are d arna d ins Dp £e during installation, remove bolt and fastener, 5 an d replace if necessary.

4. Ins ll bolts rea^k rea3ni n8 underbody rear air deflector to specifi^j Per fasc*a assembly• Torque all bolts as

T orqUe: 6 **N•m (53 in-lbs)**

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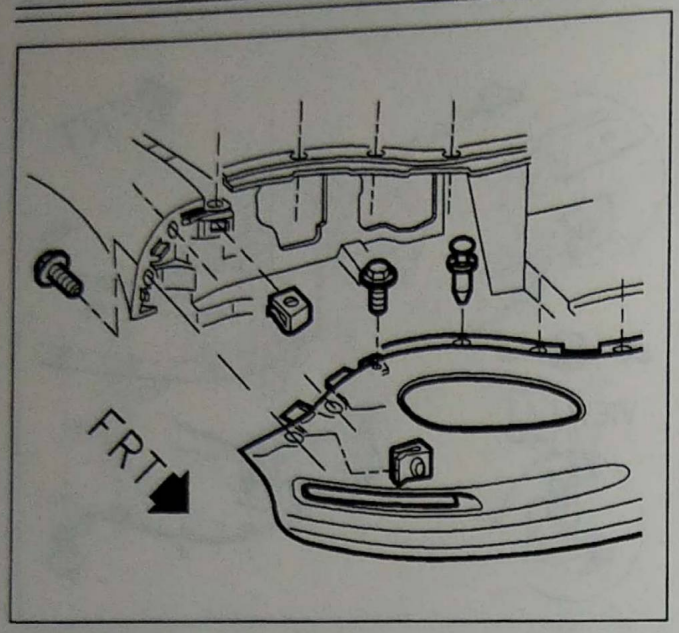

PSMGEP65874AA

FRONT END BODY COMPONENTS

FRONT BUMPER FASCIA ASSEMBLY

REMOVAL

1. Remove retainers from top of front bumper fascia assembly.
2. Raise vehicle on hoist. (Refer to "Lifting, Jacking and Support Points" section in this manual.)
3. Remove bolts retaining front underbody air deflector to front bumper fascia assembly.
4. Remove retainers from front of wheelhouse liner on each side of vehicle.
5. Remove bolts attaching front fender to fascia bumper fascia assembly on each side of vehicle.
6. Remove front bumper fascia assembly from front end panel.
7. Disconnect electrical connectors from front parking, turn signal, and side marker light assemblies.

INSTALLATION

1. Connect electrical connectors to front parking, turn signal, and side marker light assemblies.
2. Install and align front fascia assembly to front end panel. Check alignment to hood and front fender assemblies.

IMPORTANT: Refer to "Clearance and Flushness Specifications" in the "General Information" section of this manual for panel alignment specifications.

3. Install retainers to top surface of front bumper fascia assembly.
4. Install front bumper fascia assembly to fenders with bolts on each side of vehicle. Torque as specific d.

Torque: 6 N*m (53 in-lbs)

5. Install wheelhouse to front bumper fascia assembly retainers.
6. Install bolts retaining front underbody air de e fl ctor assembly to front bumper fascia assembly. Torque as specified.

Torque: 6 N-m (53 in-lbs)

7. Lower vehicle.

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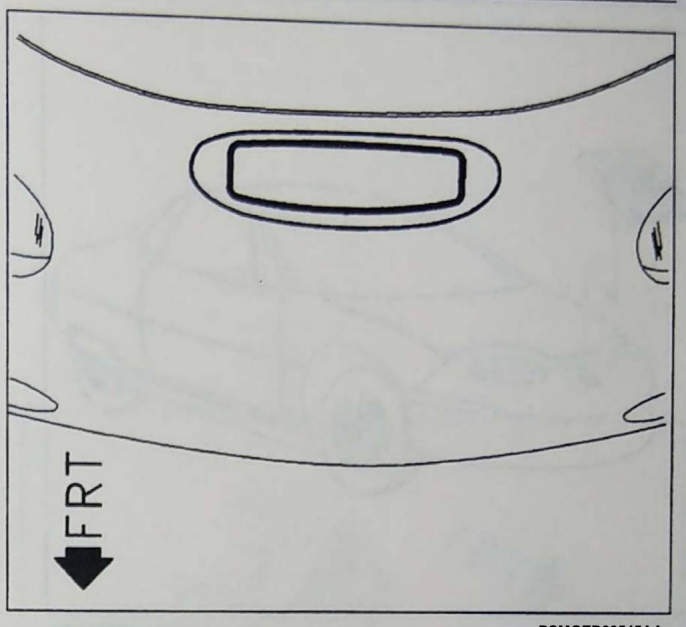
EZEL - CHARGE PORT OPENING

B

efMOVAL

Rem "Front

1. jumper Fascia Assembly" procedure in this manual)
   we front bumper fascia assembly. (Refer to
1 Remove push-on nuts from back side of front bumper fascia and bezel assembly.
3. push-out retaining tabs and remove bezel assembly.



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INSTALLATION

1 Install bezel assembly into depression in front bumper fascia insure four tabs engage on underside of front bumper fascia surface.

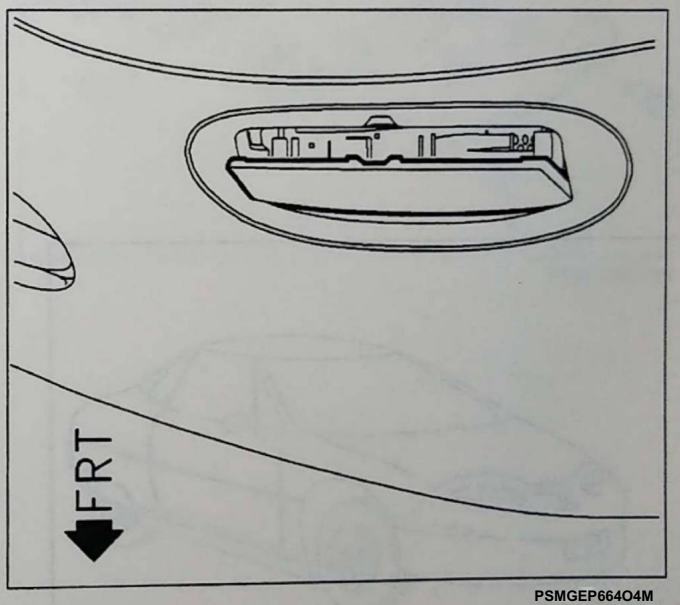
2. Install push-on retaining nuts to studs on back side of bezel.

3. Install front bumper fascia assembly. (Refer to "Front Bumper Fascia Assembly" procedure in this manual.)

DOOR - CHARGE PORT OPENING

REMOVAL

1. Remove front bumper fascia assembly. (Refer to "Front Bumper Fascia Assembly" procedure in this manual.)
2. Open charge port door and disconnect return spring.
3. Remove cotter pins from clevis pins.
4. Remove clevis pins from door to bezel mounting location.
5. Remove charge port door from bezel.



PSMGEP664O4M

'NSTALLATION

1. Install door in opening of bezel.
2. ^gn door to bezel mounting location. Insert clevis Pms through bezel and door.
3. J.nsert c°tter pins into clevis pins and bend arm on cotter pin to secure.
4. Open door and hook spring into hole on side of door.
5. Close door and hook spring into hole in bezel.
6. Insta fro
   Bum^ r?nt ^.umPer fascia assembly. (Refer to "Front Per Fascia Assembly" procedure in this manual.)

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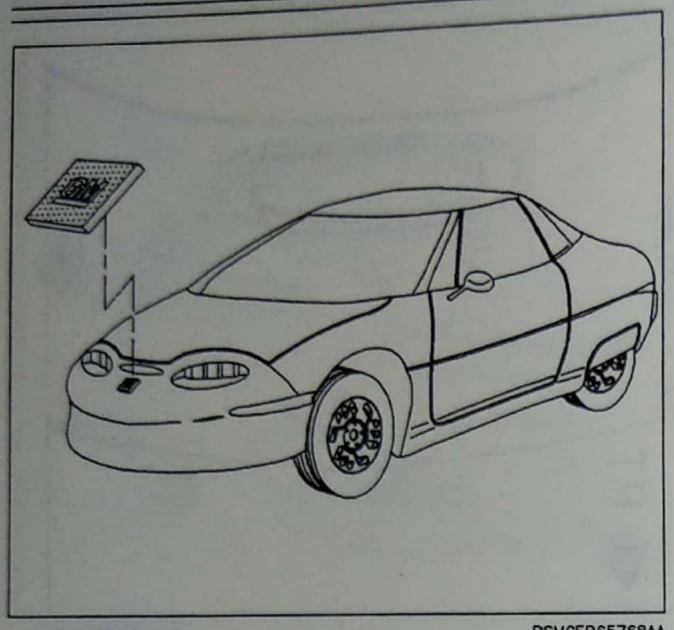


PSMGEP65768AA

FRONT FASCIA EMBLEM

REMOVAL

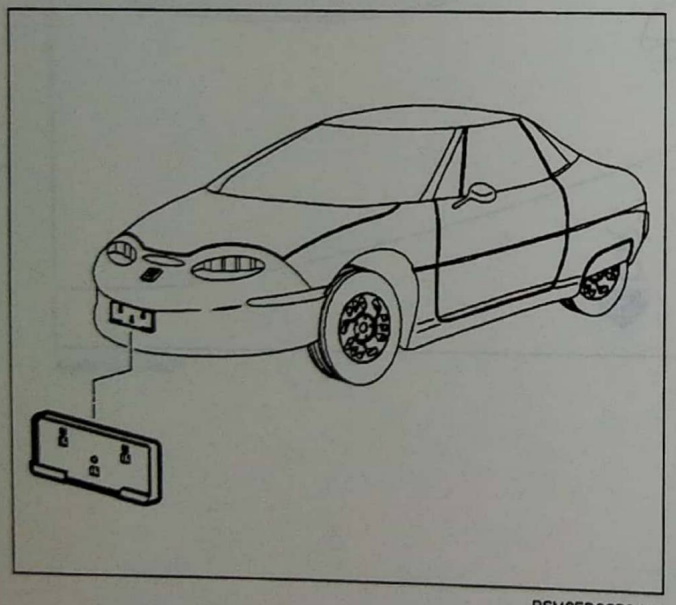
1. Hold heat gun at least 152 mm (6 in.) from emblem assembly.
2. Prv emblem assembly from front bumper fascia assembly with flat-blade tool, making sure not to damage paint.

INSTALLATION

1. Clean area with suitable solution of isopropyl alcohol (50/50 mixture by volume with water) or high-flash naphtha.
2. Wipe area with clean dry cloth.
3. Heat front bumper fascia assembly surface and adhesive side of new emblem assembly. Temperature must be 26°C (80°F) or 6°C (42°F) above air temperature in area, whichever is higher, but not exceeding 40°C (104°F).
4. Remove protective liner from adhesive strip.

IMPORTANT: Position emblem assembly carefully. Emblem assembly cannot be removed without reapplying adhesive after contact with vehicle.

5. Press emblem assembly into place and apply pressure.



PSMGEP66894AA

LICENSE PLATE BRACKET

REMOVAL

1. ^bracket ^ate retain hig screws from push nuts
2. Remove license plate from bracket.
3. fasda°alsembily et fetaining screws from front bumper

INSTALLATION

1. Locate fr°ntJ*cense plate bracket to front bumper fascia assembly.

IMPO^T

shonM^r^ i L°wer hole in license plate bracket front R 3.9/64 in.) hole at dimple in lower bumper fascia assembly. Drill should be held perpendicular to front fascia assembly and depth of hole not exceed thickness of front bumper fascia assembly.

2. gn with dimple in front bumper fascia assembly.
3. *Loose* install front license plate bracket to front bumper *fascia* assembly with one bolt.

IMP

umn^P^^: ®racLet should match contour of front ascia assembly and also appear level.

4. Align and JeveJ front license plate bracket to front Jumper fascia assembly.

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5. 3 8 mm (9/64 in.) holes in front bumper assembly using holes in bracket as guide.

6. ii holts retaining front license plate bracket to IS bumper fascia assembly.

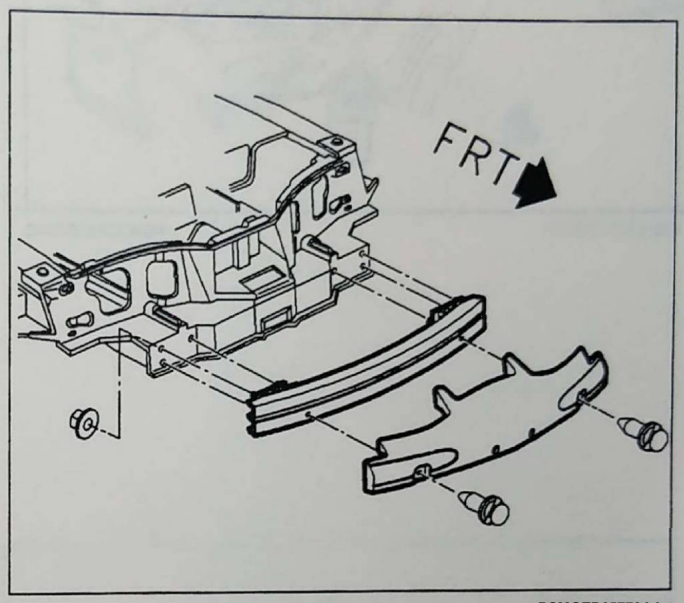
■jerque all bolts as specified.

7. **Torque: i 5 N*m (20 in—lbs)**

8. Insert push nuts into front license plate bracket.

9. Insert screws through license plate into push nuts.

ENERGY ABSORBER AND IMPACT BAR



PSMGEP65778AA

REMOVAL

1 Remove front bumper fascia assembly. (Refer to '•Front Bumper Fascia Assembly Removal" procedure in this manual.)

2. Remove retainers that attach energy absorber to front impact bar. Remove absorber.

3. Remove impact bar to frame rail attachment nuts from bar retaining studs.

4. Remove impact bar.

INSTALLATION

1. Install impact bar with attaching nuts and tighten. Torque as specified.

Torque: 15 N-m (133 in-lbs)

2. Install front impact energy absorber to front impact bar with retainers.

3. Install front fascia assembly. (Refer to "Front Bumper Fascia Assembly Installation" procedure in this manual.)

4. Install underbody front air deflector assembly. (Refer to Front Air Deflector Installation" procedure in this manual.)

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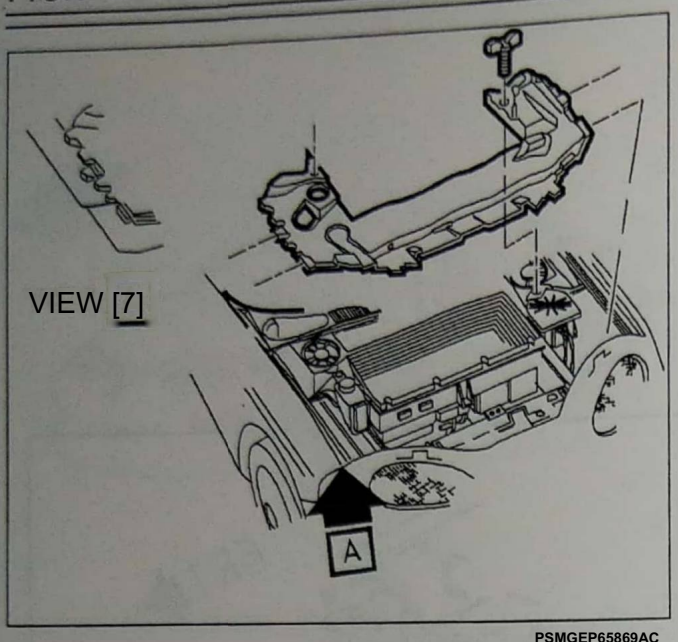

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cKifiNE COMPARTMENT - FRONT SIGHT SHIELD (BEAUTY PANEL)

REMOVAL

1. Raise hood to open position, and support with hold-open rod.
2. Remove two retaining fasteners securing engine compartment front sight shield to mounting brackets.
3. For the right side, disengage tabs from under front upper rail.
4. For the left side, disengage tabs from under front upper rail.
5. Disengage tabs from front end panel and lift-out engine compartment front sight shield.

INSTALLATION

1. For the right side, install tabs from under front upper rail assembly.
2. For the left side, install tabs from under front upper rail assembly.
3. Align and install tabs on front edge of engine compartment front sight shield with cut-outs in front end panel.

IMPORTANT: Make sure locating tabs are properly tucked-in at all body locations and windshield washer solvent container tag is above front sight shield.

4. Align engine compartment front sight shield as necessary, and install retaining fasteners.

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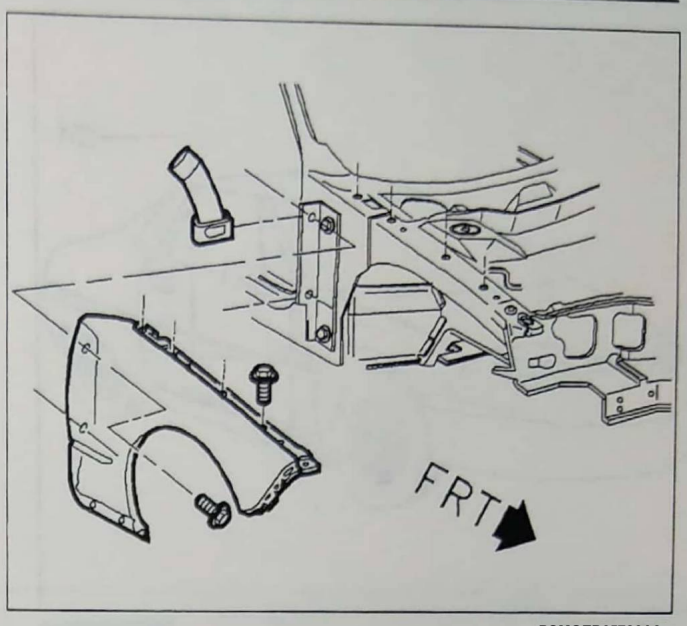
^NT FENDER ASSEMBLY AND BRACKETS

NOTICE: Tape f[ror]l fender assembly and door edges to prevent vehicle damage during front fender assembly removal and installation.

REMOVAL

1. [Rem]ove bolts from fender flange to upper motor [co]mpart[ment] rail.
2. Raise and suitably support vehicle.
3. [RemO]ve bolts from lower fender to rocker outer finish panel flange.
4. Remove plastic retainers at wheelhouse panel to fender joint.
5. Remove bolts from rear fender bracket through inside of wheelhouse area.
6. Remove bolts from front bumper fascia assembly through inside of wheelhouse area.
7. Remove fender.
8. Remove rear upper bracket bolts and rear upper bracket.
9. Remove rear lower bracket bolts and rear lower bracket.



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INSTALLATION

1. Install rear fender bracket to body with bolts. Torque as specified.

Torque: 10 N*m (89 in-lbs)

2. Position fender on motor compartment side rail. Install tabs at leading edge of fender and front bumper fascia assembly into retaining slots.

IMPORTANT: Refer to "Clearance and Flushness [S]Pacifications" in the "General Information" section of this manual for panel alignment specifications.

3. Align fender to door and hood.
4. Install bolts fender flange to upper motor [co]mpartment side rail. Torque as specified.

[Tor]que: 6 N»m (53 in-lbs)

5. Align [fe]?[d]e[rt0] front bumper fascia assembly bolts through [w]neelhouse area. Torque as specified.

Jerque KM-

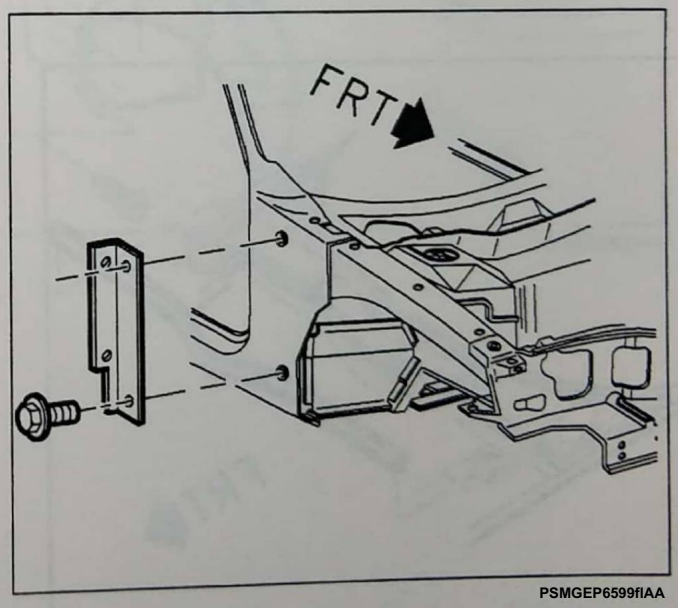
6 N*m (53 in-lbs)

6. Align fender to door. Install bolts to fender bracket [thro]ugh wheelhouse area. Torque as specified.

Torque:

7. Inst[ll wh] 6 N‹m (53 in_lbs)
^ta^ners[160^101150 ^ane^t0 ^en]d[er] with pl[ast*c]
8. Inst Ml bolts at bottom of fender. Torque as specified.

Torque: 6 N•m (53 in–lbs)



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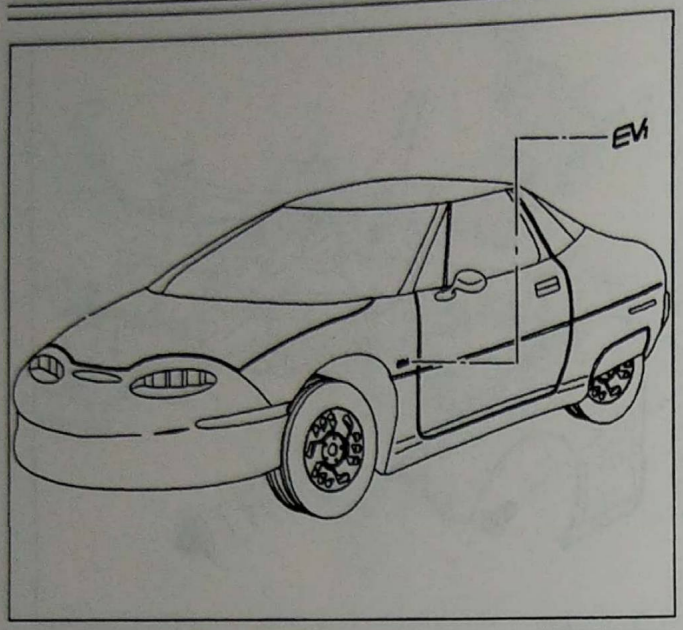


PSMGEP66026AA

FRONT FENDER EMBLEM

REMOVAL

1. Hold heat gun at least 152 mm (6 in.) from emblem assembly.
2. Remove emblem by pulling carefully from fender assembly.

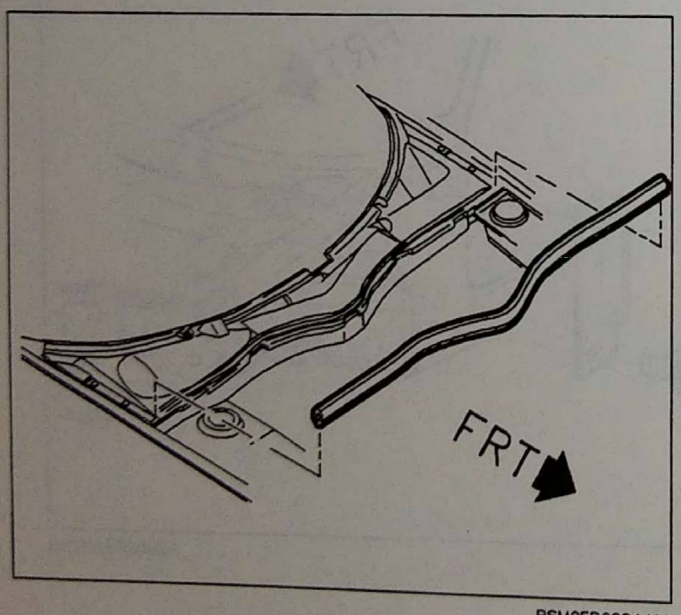
INSTALLATION

NEW EMBLEM ASSEMBLY

1. Clean area with suitable solution of isopropyl alcohol (50/50 mixture by volume with water) or high-flash naphtha.
2. Wipe area with clean dry cloth.
3. Heat emblem assembly surface and adhesive side of new seal assembly. Temperature must be 26°C (80°F) or 6°C (42°F) in area, whichever is higher, but not exceeding 40°C (104°F).
4. Remove protective liner from adhesive strip.
5. Position emblem to fender mounting location.

IMPORTANT: Position emblem carefully. Emblem cannot be removed without reapplying adhesive after contact with vehicle.

6. Press emblem into place and apply pressure.



PSMGEP66044AA

AIR INLET SCREEN SEAL

REMOVAL

1. Hold heat gun at least 152mm (6 in.) from air inlet screen seal.
2. Remove seal by pulling carefully from front edge air inlet screen assembly.
3. Clean area with suitable solution of isopropyl alcoho (50/50 mixture by volume with water) or high-flas naphtha.
4. Wipe area with clean dry cloth.

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TALLATION

LEAL ASSEMBLY

NE air ,nlet screen assembly surface and adhesive
I H£3t f new seal assembly. Temperature must be 26° C
side r 6°C (42°F) in area, whichever is higher, but
(80°F) or not exceeding 40°C (104°F).

g move protective liner from adhesive strip on seal.

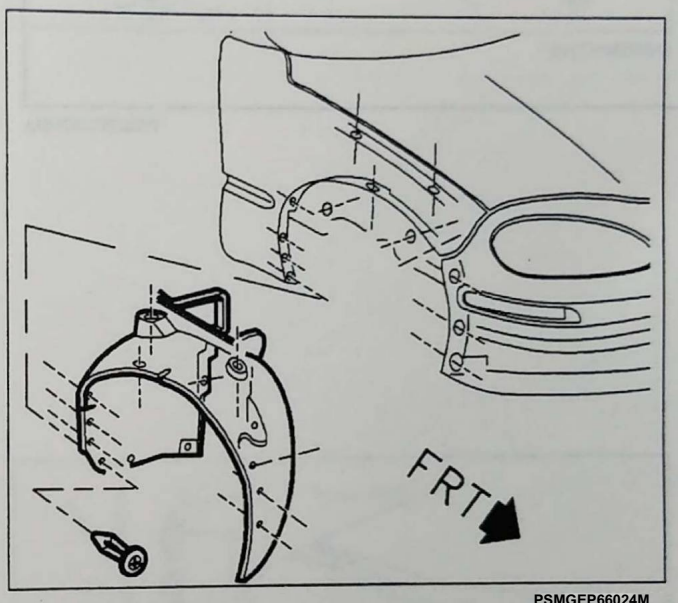
2. e

1 stall cowl seal to front edge of air inlet screen
3. in assembly-

ORTANT: Position seal assembly carefully. Seal
hlv cannot be removed without reapplying adhesive
^contact with vehicle.

. press seal assembly into place and apply pressure.
4.

FRONT WHEELHOUSE PANEL LINER



PSMGEP66024M

REMOVAL

1. Raise vehicle on hoist. (Refer to "Lifting, Jacking, and Support Points" section in this manual.)

1 Remove front wheel and tire assembly.

3. Remove plastic fasteners attaching wheelhouse panel liner to front bumper fascia assembly, compartment side panels, and inner wheelhouse panel.

4. Remove bolts/screws retaining wheelhouse panel liner to front underbody air deflector.

5. Remove plastic fasteners at outer edge of wheelhouse panel liner to fender attachment location.

IMPORTANT: Note location where wheelhouse panel iiner tucks in behind outer edge of fender for reassembly.

6. Remove wheelhouse panel liner.

•NSTALLATION

1. Position wheelhouse panel liner into opening.

2. ^Uck center section of outer edge of wheelhouse
. ane liner behind fender attachment location,

3. hstall plastic retainers at outer edge of panel,

4. Install liner ^ast*c Stoners to inner wheelhouse panel

5. Install underk)<^tS^crews wheelhouse panel liner to front
5 y air deflector assembly.

In fr
^^cifi^ W^ee^ and tire assembly. Torque lug nuts

Torque:
120N.m(89ftqbs)

7. Chicle.

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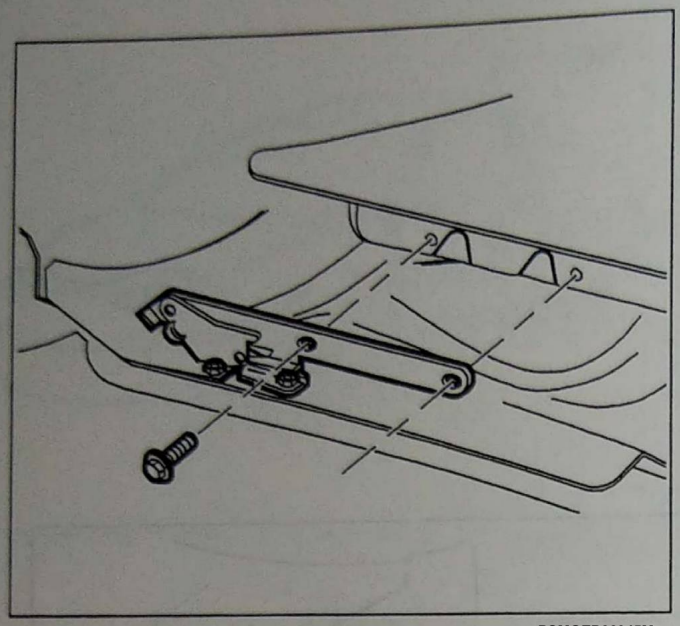
HOOD PANEL



PSMGEP66045M

NOTICE: Raise hood panel assembly and install protective coverings over fender assembly areas to prevent damage to paint when removing or installin hood panel assembly. g the

REMOVAL

1. Support hood in open position. If old hood is to be re-installed, mark position of hood to hinge locatio by marking around hood hinges with soft marker "
2. With aid of a helper, lower hood rod, remove hinge to hood bolts. Remove hood.

INSTALLATION

1. With aid of helper, place hood in position and install hinge to hood bolts. Position hood rod.
2. If old hood is being installed, align hood locating marks at hinges. Torque as specified.

Torque: 13 Nun (10 ft-lbs)

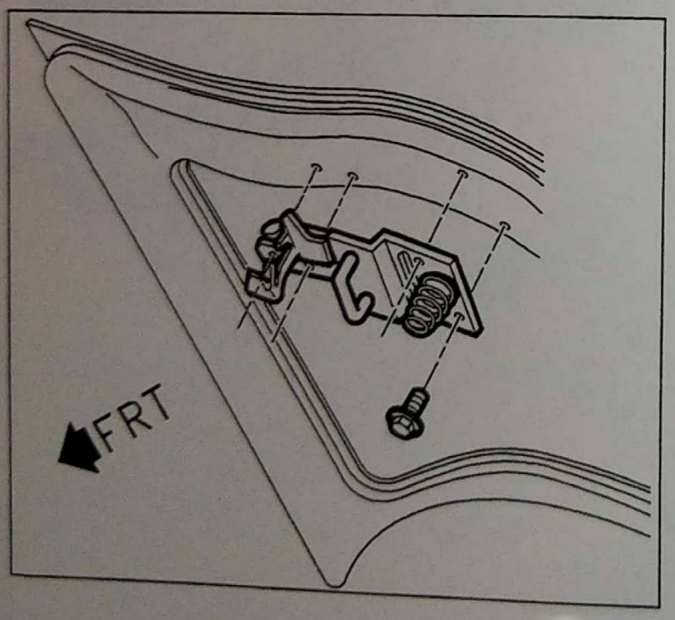
3. If new hood is installed, loose install hinge bolts.
4. Lower hood slowly and check fit. Adjust hood as required. (Refer to "Hood Adjustment" procedure in this manual.) Torque bolts as specified.

Torque: 13 N*m (10 ft-lbs)

5. Install hood striker to hood with three bolts. Adjust hood primary latch assembly if required. (Refer to "Hood Adjustment" procedure in this manual.) Torque bolts as specified.

Torque: 13 N*m (10 ft-lbs)

HOOD PRIMARY LATCH STRIKER ASSEMBLY



PSMGEP66152M

REMOVAL

1. Support hood in open position. If old hood is to e used, mark position of hood striker to hood oca l by marking around striker with soft marker. b tion
2. Remove bolts retaining hood striker assembly to hood.

INSTALLATION

1. Support hood in open position.
2. If old hood is being used, align hood striker assem locating marks at hood. Torque as specifie . bly d

Torque: 13 N*m (10 ft-lbs)

3. If new hood striker assembly is installed, loose in striker bolts. stall
4. Lower hood slowly and check alignment. Adjust striker assembly if required. Torque bolts as spc hood cified.

Torque: 13 N*m (10 ft-lbs)

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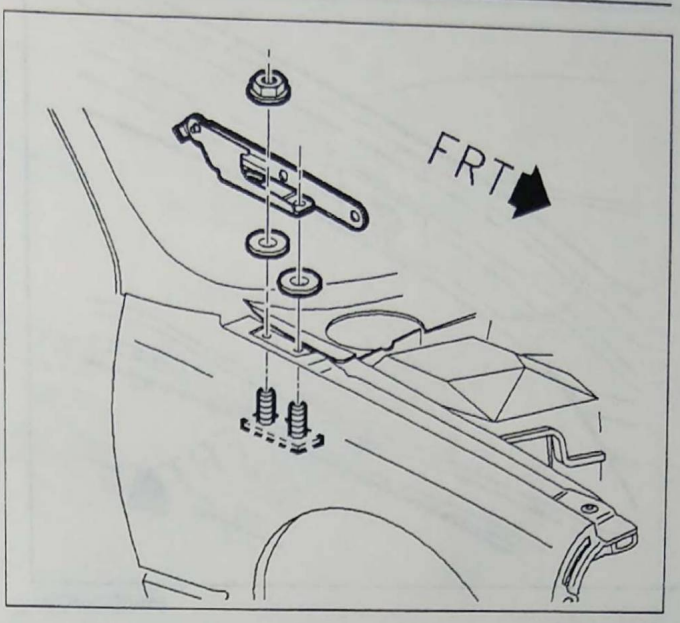
HOOD HINGE

NOTICE: Raise hood panel assembly and install protective coverings over fender assembly areas to prevent damage to paint when removing or installing hood hinge assembly.



PSMGEP66089A8

REMOVAL

IMPORTANT: Using this procedure, remove only one hinge at a time.

1. Support hood in open position.
2. Mark position of hood hinge on body and hood assembly with a soft marker for installation.
3. Remove retaining bolts from hood attachment point.
4. Remove retaining nuts from hood stud plate.
5. Remove hinge from body.

INSTALLATION

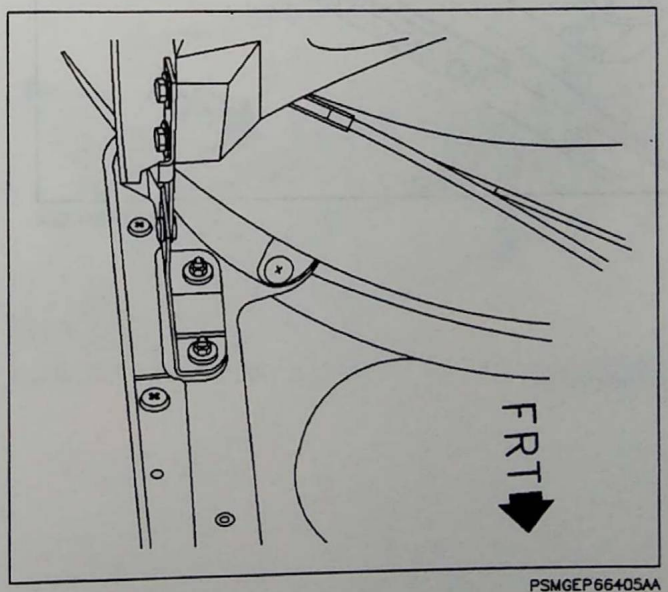
1. Install and align hinge to locating marks on hood and body.
2. Tighten retaining nuts and bolts.

Torque: 13 N*m (10 ft-lbs)

3. Check hood fit. Adjust fit if required. (Refer to "Hood Adjustment" procedure in this manual.) Torque bolts and nuts as specified.

HOOD ADJUSTMENT

The hood panel assembly, front fender assemblies and hood hinges are designed so that adjustment can be made. If the hood panel assembly can not be brought into specifications as shown by loosening hood hinge bolts or adjusting the hood front bumper assemblies, the structural body should be checked for damage or misalignment.



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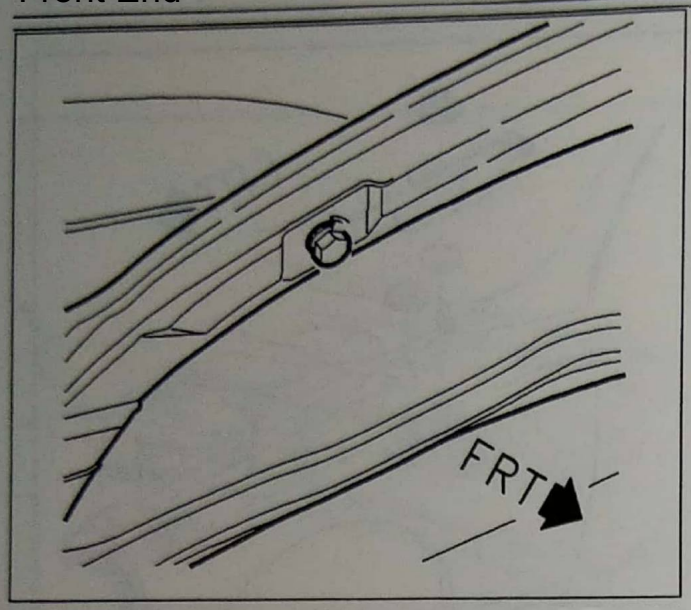

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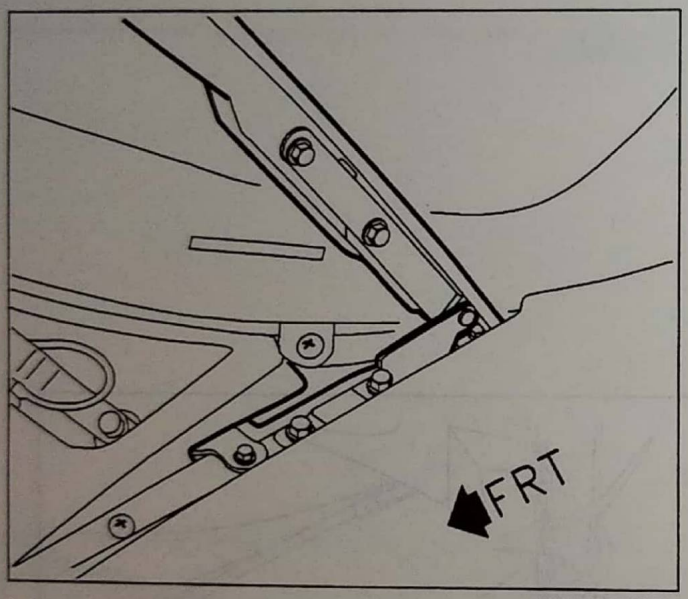
HOOD HEIGHT ADJUSTMENT

1. Close hood panel assembly firmly.
2. Determine amount of adjustment needed. (Refer to "Clearance and Flushness Specifications" in this manual.)
3. Open hood panel assembly.
4. Change height at front of hood by turning bumper assemblies up or down or by adjusting hood latch.



PSMGEP664O3AA

5. Adjust hood up or down at rear by loosening hinge to hood bolts and position as needed.
6. Repeat above steps until hood panel assembly is properly aligned. Torque bolts as specified.

Torque: 13 N*m (10 ft-lbs)

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f0RE AND AFT ADJUSTMENT

AD,'n"'he hood hinge nuts or hood hinge bolts, then cittlCr 'hood forward or rearward. For best appearance,

^Usid",a‘‘me'

j Loosen hood hinge to body nuts.

2. Move hood panel assembly forward or rearward.

IMPORTANT: Refer to “Clearance and Flushness Specifications” in the “General Information” section of this manual for panel alignment specifications.

3 Tighten hood hinge nuts to specifications.

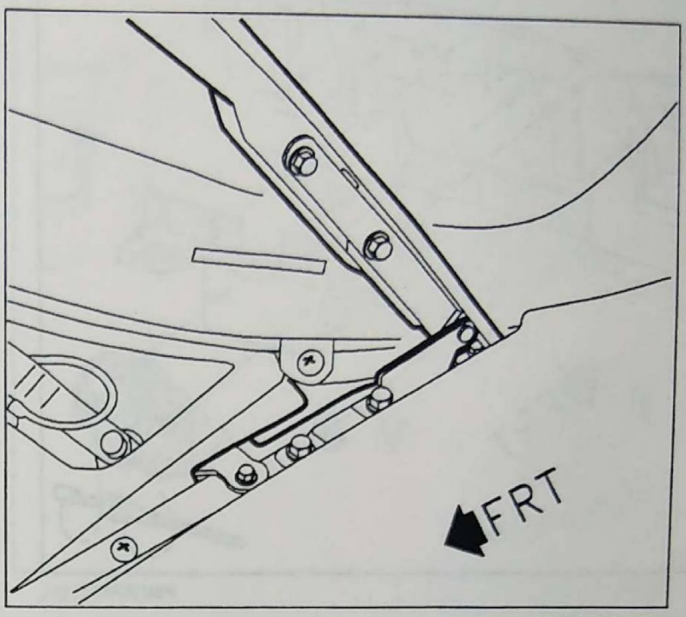
Torque: 13 N*m (10 ft-lbs)

4. Loosen hood hinge to hood nuts.

5. Move hood panel assembly forward or rearward. Refer to illustration for hood panel alignment specifications.

6. Tighten hood hinge bolts to specifications.

Torque: 13 N*m (10 ft-lbs)



PSMGEP664O3AA

HOOD HOLD OPEN ROD

REMOVAL

1- Safely support hood panel assembly in full open position.

2 - Push hood hold open rod toward engine and twist rod out of bushing.

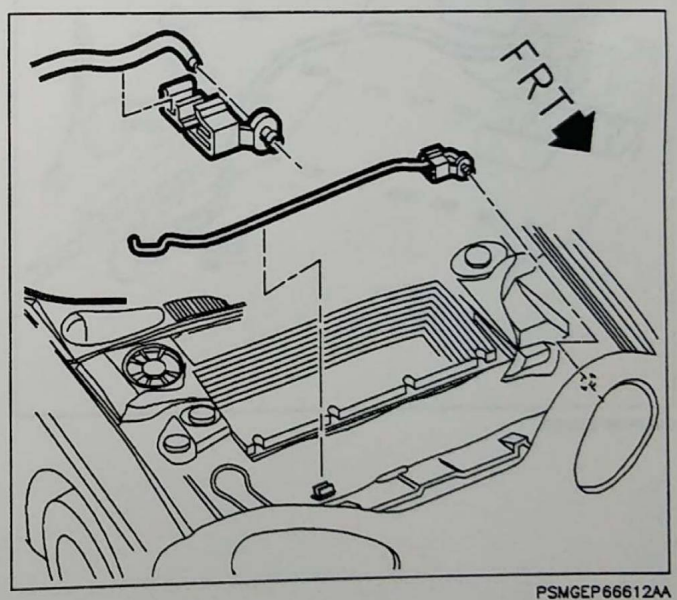
3 - If required, pry bushing out of upper condenser radiator fan module CRFM bracket.

■NSTALLATION

1. If removed, install bushing in upper condenser radiator fan module (CRFM) bracket.

2. Jristall rod into bushing by pushing rod in and wistin*o*

3. Remove hood support and close hood.



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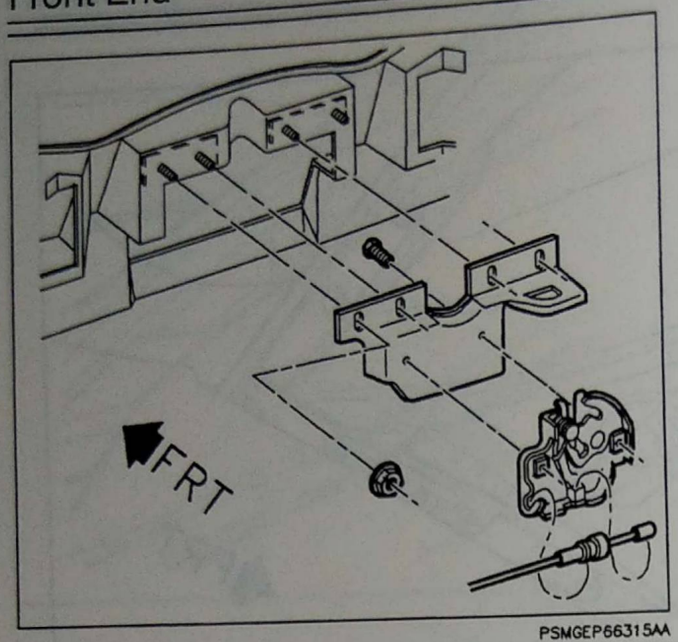

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HOOD PRIMARY LATCH ASSEMBLY

REMOVAL

1. Remove front end close out panel.
2. Mark position of hood primary latch bm, support assembly. y cfl b° hs on latch
3. Remove hood primary latch bolts.
4. Remove hood release cable assemhi primary latch assembly. " b y from hood
5. Insert screwdriver into latch clip and lift release cable assembly from hood h ,, • " hood ,atch assembly. primary latch
6. Mark location of hood primarv front end panel. ,atch assemb'y on
7. Remove latch support bolts and latch assembly.

INSTALLATION

1. Install support assembly, if removed.

2. Pc itio latch *duJing Jemova?13130"1 3SSembly with mark* **made*
3. Install latch support assembly and latch support bolts, if removed. Torque as specified.

Torque: 33 N«m (24 *ft-lbs)*

4. Install ho *assembly* d Felease cable to h°od primary latch
5. Be hoTT^ 'bood' check adjustment and operation ot hood primary latch assembly.
6. Install front end close out panel.

HOOD **LATCH** ADJUSTMENT

The striker p.ate in the allow normal fnr bood panel is ,ar e enou h t0 *adjustmernI* n™ t ad/ft ad >tment. Cross vehicle Plate. UD and H Vlded at the hood primary latch striker four nuts.secur'0△ a^ustment is *provided* by loosening ln® atch to support plate.

When th ho d?atCb assem Wy has been removed, the mounting hnf? ? make certain rt °° ene d or the hood *adjustment change , obtained* at the ro er adjustment has been Proper cro fct ^f^tening the mounting nuts and bolts, achieved hv ve cle adjustment of the striker L w *awerin S the hood onto the latch with tighten* bolts ach ng bolts loose Raise the hood and

Fa ihur t^ u he above procedure may result in *damage efforts dup asseni bly and/or excessive release handle Lower misa hgtment when the hood is closed.* close secur hood to *3 resting Positi on on the primary latch an* e y.

HOOD RELEASE CABLE

REMOVAL

1. Raise hood.

2 Remove engine compartment front sight shield. (Refer to “Engine Compartment Front Sight Shield” procedure in this manual.)

3. Disassemble hood primary latch release cable assembly from primary' latch assembly.

4. Disassemble cable assembly by inserting a screwdriver into latch clip and lifting cable assembly from primary latch assembly.

5. Pry cable grommet from primary latch assembly.

6. Tape a 2.4 m (8 ft.) length of wire to latch end of cable. Note routing of hood cable in engine compartment for installation.

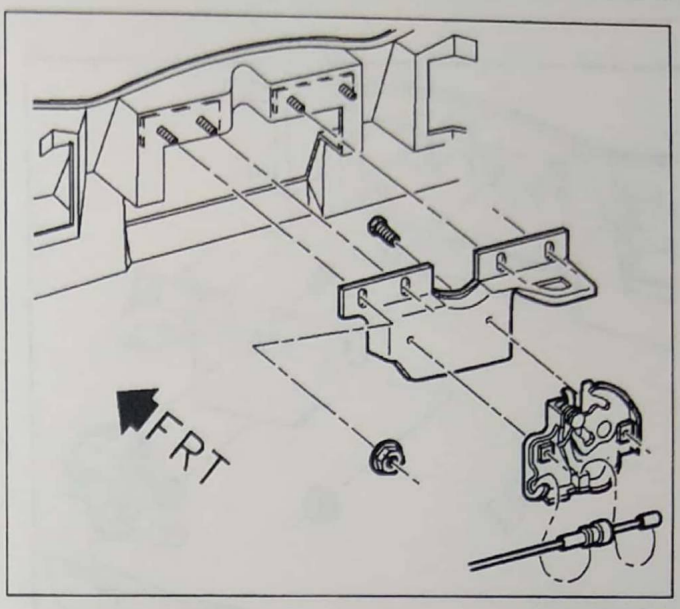
7. Pull primary' latch release cable assembly out through hole in front end panel.

8. Unsnap latch release cable from retaining clips at inside of left front rail.

9. Remove nuts and washers from brake/torque control module (BTCM) mount at drivers side body hinge pillar.

IMPORTANT: Note routing of cable under dash for installation to prevent binding.

10. Pull cable to interior of vehicle, through cowl grommet.



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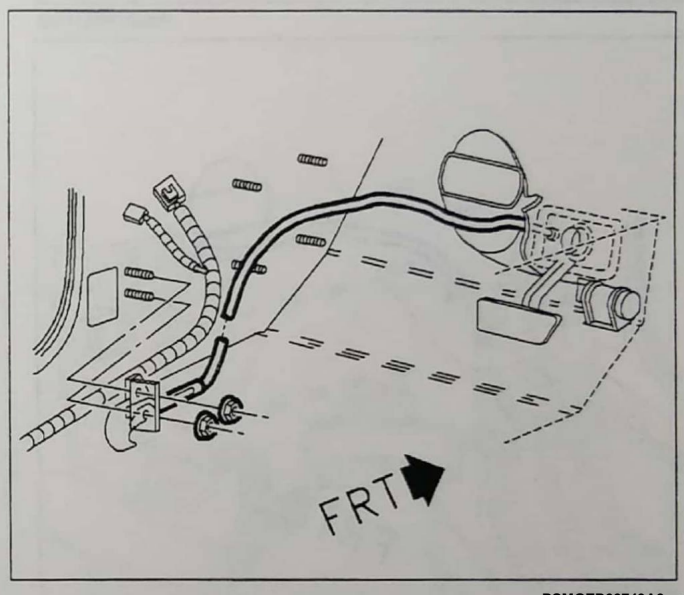

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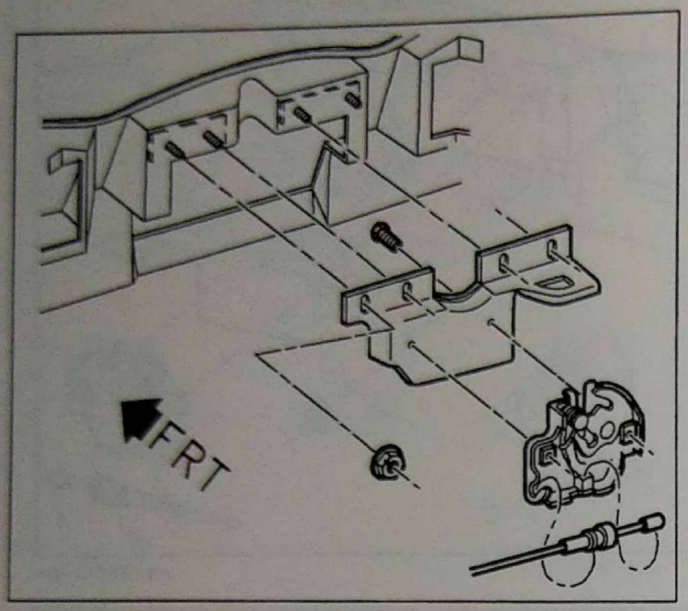

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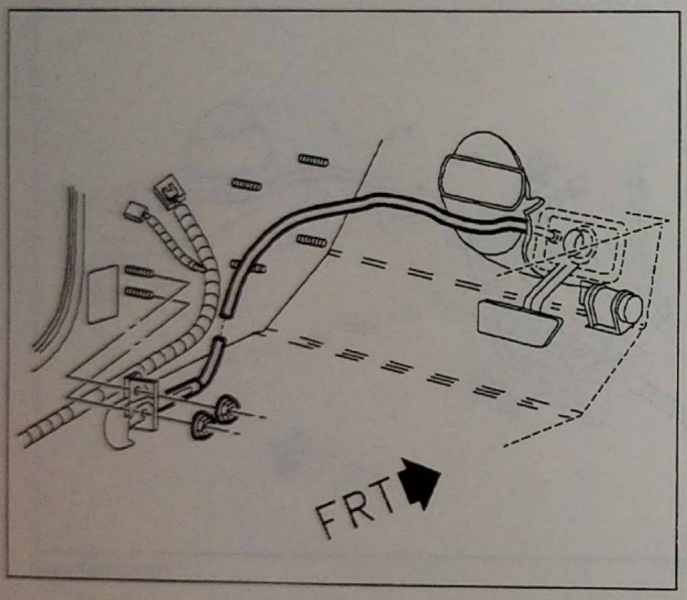

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INSTALLATION

1. Tape feeder wire onto end of new cable.
2. Pull cable through cowl grommet into engine compartment using feeder wire. Route hood primary latch release cable assembly where previously noted
3. Remove feeder wire from cable.
4. Install cable to body at drivers side body hinge nil using nuts and washers. Torque as specified.

Torque: 6 N*m (53 in-lbs)

5. Assemble cable to retaining clips on inside of left front rail.
6. Assemble hood primary latch release cable assembly to primary latch assembly.
7. Check hood latch cable operation prior to closing hood.
8. Install engine compartment front sight shield. (Refer to “Engine Compartment Front Sight Shield” procedures in this manual.)
9. Close hood.

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FRONT EXTERIOR LAMPS

HEADLAMP BULB

CAUTION: HALOGEN BULBS CONTAIN A GAS UNDER PRESSURE. HANDLING A BULB IMPROPERLY COULD CAUSE IT TO SHATTER INTO FLYING GLASS FRAGMENTS. TO HELP AVOID PERSONAL INJURY:

- **TURN OFF THE HEADLAMP SWITCH AND ALLOW THE BULB TO COOL BEFORE CHANGING BULBS. LEAVE THE HEADLAMP SWITCH OFF UNTIL THE BULB CHANGE IS COMPLETE.**
- **ALWAYS WE AR EYE PROTECTION WHEN CHANGING A HALOGEN BULB.**
- **HANDLE THE BULB ONLY BY ITS BASE. AVOID TOUCHING THE GLASS.**
- **DO NOT DROP OR SCRATCH THE BULB. KEEP MOISTURE AWAY.**
- **PLACE THE USED BULB IN THE NEW BULB'S CARTON AND DISPOSE OF IT PROPERLY. KEEP HALOGEN BULBS OUT OF REACH OF CHILDREN.**

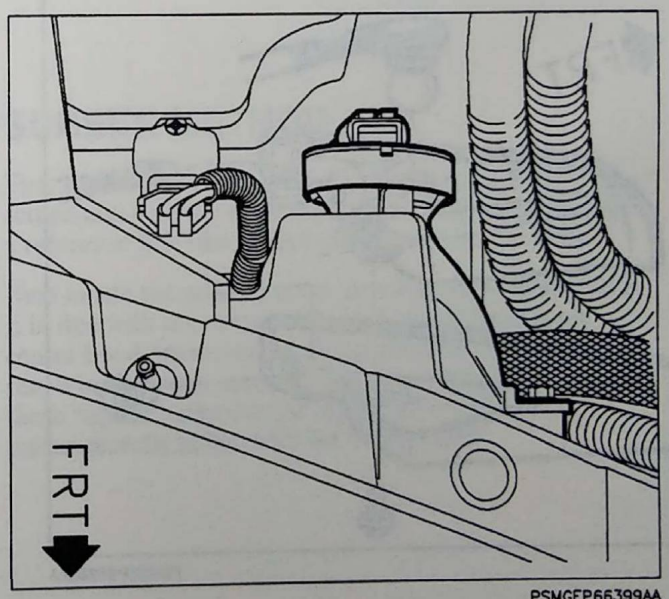
REMOVAL

1. Disconnect headlamp bulb sockets from headlamp lens by depressing locking tab and rotating socket 1/4 tum. Pull socket rearward until bulb clears housing and lift up for access to bulb assembly.
2. Remove headlamp bulb from headlamp harness connector.

INSTALLATION

1- Without touching the glass, connect headlamp bulb to harness connector.

2. Insert bulb into headlamp housing and rotate 1/4 turn to lock. (Assembly must be correctly positioned to insert and lock.)



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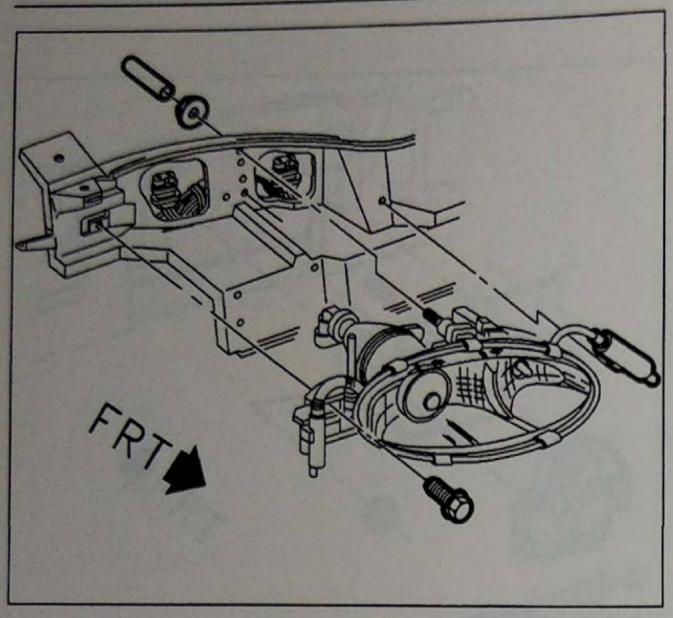

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HEADLAMP HOUSING ASSEMBLY

REMOVAL

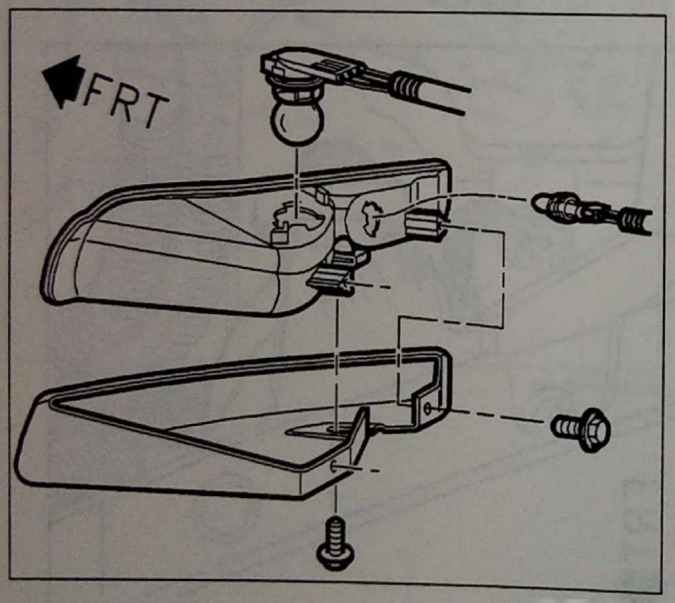
1. Remove front bumper fascia assembly. (Refer to "Front Bumper Fascia Assembly" procedure in thk manual.)
2. Remove insulator and retaining nuts from headlamn assembly studs at rear of front end panel.
3. Remove bolt/screw from front side of front end panel
4. Disconnect wiring harness to lamp assembly.
5. Remove headlamp assembly from front end panel.

INSTALLATION

1. Install headlamp assembly to front end panel and secure with nuts from rear, and bolt/screw from front. Torque as specified.

Torque: 8 N*m (71 in-lbs)

2. Connect wiring harness to lamp assembly.
3. Install insulator over lower stud.
4. Install front bumper fascia assembly. (Refer to "Front Bumper Fascia Assembly" procedure in this manual.)



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PARK, FRONT SIDE MARKER AND TURN SIGNAL LAMP ASSEMBLY

REMOVAL

1. Remove front bumper fascia assembly. (Refer to "Front Fascia" procedure in this manual.)
2. Disconnect and remove park/turn lamp and side marker bulb sockets from lamp assembly.
3. Remove retaining bolts/screws. Lift out lamp assembly from back side of front bumper fascia assembly.

INSTALLATION

1. Install lamp assembly to front bumper fascia assembJ with retaining bolts/screws. Torque as specific

Torque: 1.5 N*m (20 in-lbs)

2. Install park/turn lamp and side marker bulb socke assemblies to lamp assembly.
3. Install front bumper fascia assembly. (Refer to Bumper Fascia Assembly" procedure in this man

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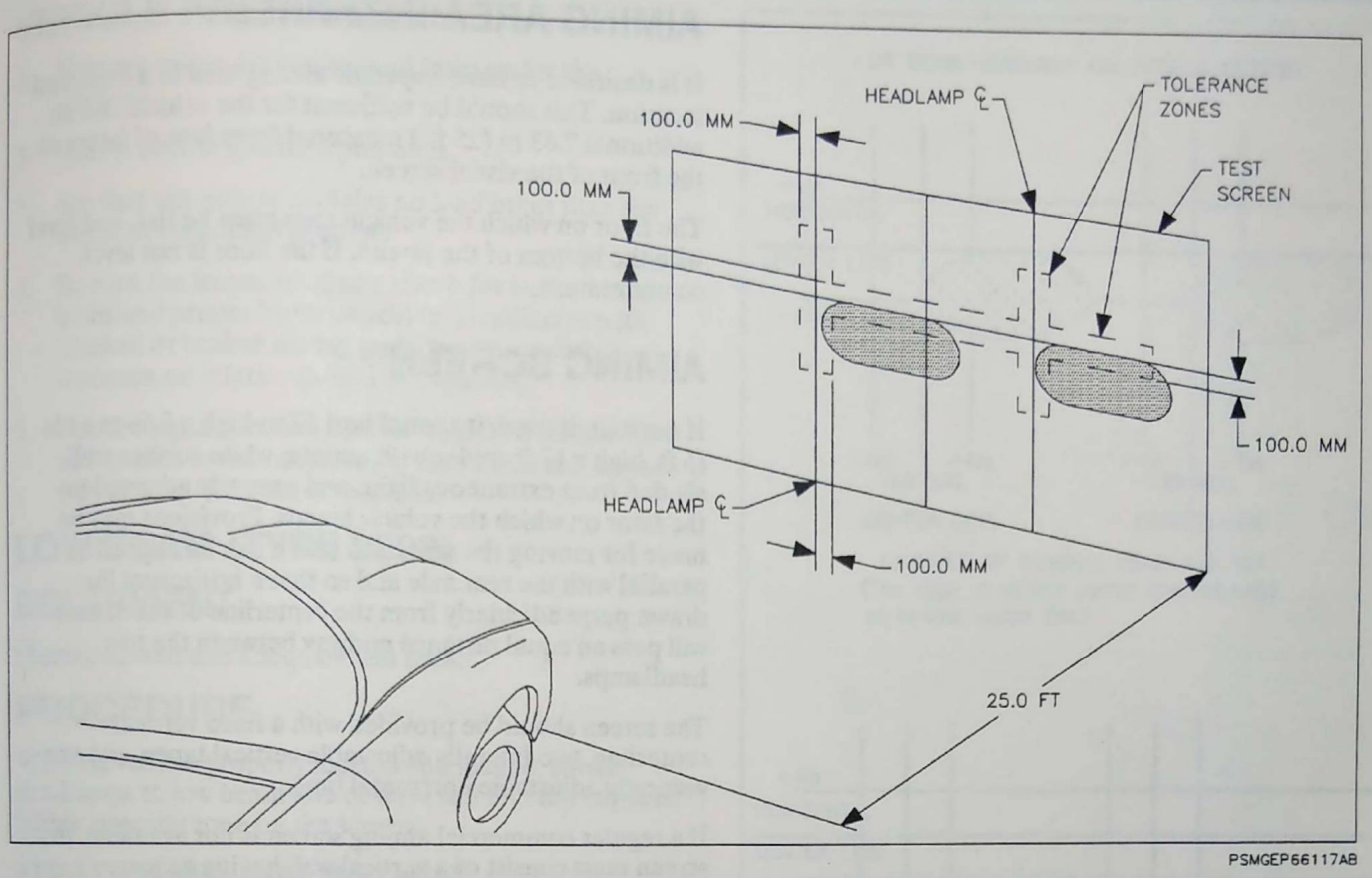

HEADLAMP AIMING

All equipment for testing headlamps must comply with the Society of Automotive Engineers recommended practice for headlamps inspection equipment.

HEADLAMP TESTING MACHINE

If a headlamp testing machine is used, it should give results equivalent to those obtained using the screen procedure shown. It should be in good repair and adjustment, and be used in accordance with the manufacturer's instructions. The machine using a photoelectric cell or cells to determine aim should also have a visual screen upon which the beam pattern is projected proportional to its appearance and aim on a screen at 7.63 m (25 ft.). Such visual screen should be plainly visible to the operator and should have horizontal and vertical reference lines to permit visual appraisal of the lamp beam.

SCREEN METHOD

First locate the vehicle so that it is square with the screen and with the front of the headlamps directly over a reference line which has been painted on the floor.

Next locate the centerline on the aiming screen so that it is in line with the center of the vehicle. If there is no center hood ornament, mark the center of the front and rear windows with narrow strips of masking tape. Use these "sights" to locate the centerline of the aiming screen directly in line with the vehicle axis.

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AIMING AREA REQUIRED

It is desirable to have a specific aiming area in a darken a location. This should be sufficient for the vehicle and an additional 7.63 m (25 ft.) measured from face of lamps tn the front of the visual screen.

The floor on which the vehicle rests must be flat, and level with the bottom of the screen. If the floor is not level compensate.

AIMING SCREEN

If a screen is used, it should be 1.52 m high x 3.66 m wide (5 ft. high x 12 ft. wide) with a matte white surface well shaded from extraneous light, and properly adjusted to the floor on which the vehicle stands. Provisions may be made for moving the screen so that it can be aligned parallel with the rear axle and so that a horizontal line drawn perpendicularly from the centerline of the screen will pass an equal distance midway between the two headlamps.

The screen should be provided with a fixed vertical centerline, two laterally adjustable vertical tapes, and one vertically adjustable horizontal tape.

If a regular commercial aiming screen is not available, the screen must consist of a vertical wall having a clear uninterrupted area approximately 1.83 m high x 3.66 m wide (6 ft. high and 12 ft.) wide.

The surface should be finished with a washable non-gloss white paint.

After the aiming screen has been set up in its permancn location, it is necessary to paint a reference line on floor directly under the lens of the lamps to indteat proper location of the headlamps when they are t?ei aimed.

IMPORTANT: Aim composite headlamps on LO W only.

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VEHICLE PREPARATION

1 Remove excess ice and/or mud from under the fenders.

2 Inflate tires to specified pressures.

3 See that the vehicle contains no load other than the driver in his normal position.

4 Be sure the lenses are clean; check for burned out bulbs and proper beam switching. Headlamps with cracked or broken aiming pads, lenses, or visible moisture on interior should be replaced.

5. Check suspension. See that the vehicle does not lean to one side or the other. Rock the vehicle sideways to free and equalize the suspension.

LOW BEAM (TYPE 9006)

EQUIPMENT

Marked screen and adequate test area.

PROCEDURE

With the vehicle properly located and loaded, switch headlamps to low beam and observe left and top edges of highly intensity zone on the screen.

HEADLAMP AIM WITHIN SPECIFICATIONS:

If left edge is horizontally more than:

102 mm (4 in.) LEFT, or

102 mm (4 in.) RIGHT of straight ahead.

HEADLAMP NOT WITHIN SPECIFICATIONS:

If the top edge is vertically more than:

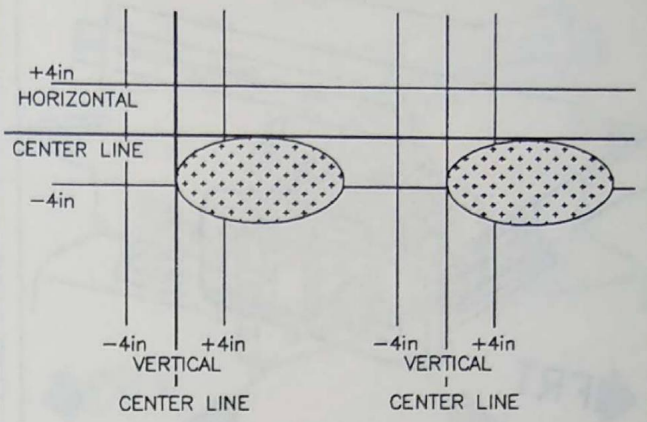
102 mm (4 in.) ABOVE, or

102 mm (4 in.) BELOW the horizontal line.

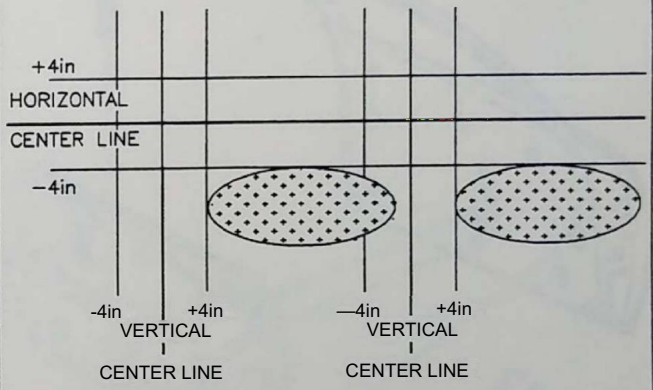
BULB REPLACEMENT CHART

BULB LOCATION	PART NUMBER	TRADE
Low Beam Headlamp	9441733	9006
High Beam Headlamp	9441732	9005
Front Marker Light	9421330	194
Front Turn Indicator	9441839	3057
Rear Turn Signal / Tail Lamp	9441839	3057
Rear Stop Lamp	11516148	3357
Rear Marker Lamp	9421330	194
License Plate Lamp	9421330	194
Back-up Lamp	9441839	3057

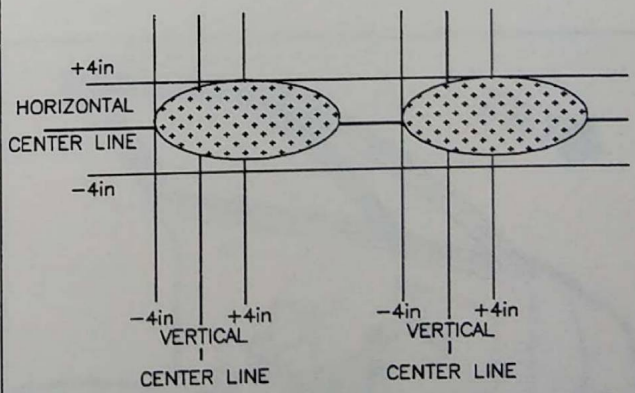
LOW BEAM HEADLAMP AIM SCREEN METHOD



EXAMPLE OF NOMINAL HEADLAMP AIM
(Top edge at vertical center line,Lett edge at vertical center line.)



EXAMPLE OF "ACCEPTABLE" HEADLAMP AIM
(Top edge at 4in below horizontal center line.)
(Left edge at 4in right of vertical center line.)



EXAMPLE OF "ACCEPTABLE" HEADLAMP AIM
(Top edge at 4in above horizontal center line.)
(Left edge at 4in left of vertical center line.)

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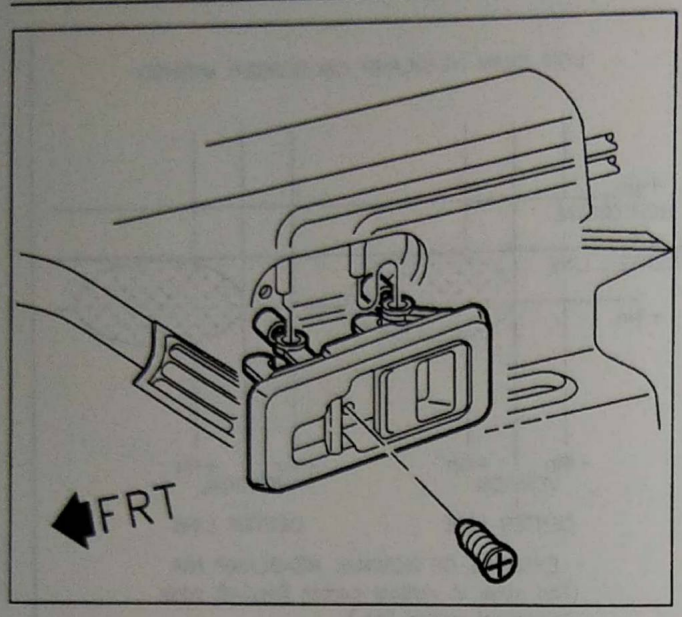

PSMV1S66013M

FRONT DOOR COMPONENTS

INSIDE DOOR HANDLE

REMOVAL

1. Remove screw from door handle and slide door handle assembly forward and then outward.
2. Using a long thin screwdriver, disengage lock and latch rods from retainer.
3. Remove handle assembly.

INSTALLATION

1. Position door handle assembly into trim panel.
2. Tip handle outward at top. Lift latch and lock rods into retainers and latch retainer clamps.
3. Push handle into trim panel and slide rearward to engage tangs.
4. Install screw in handle. Tighten screw.

Torque: 1.5 N*m (13 in-lbs)

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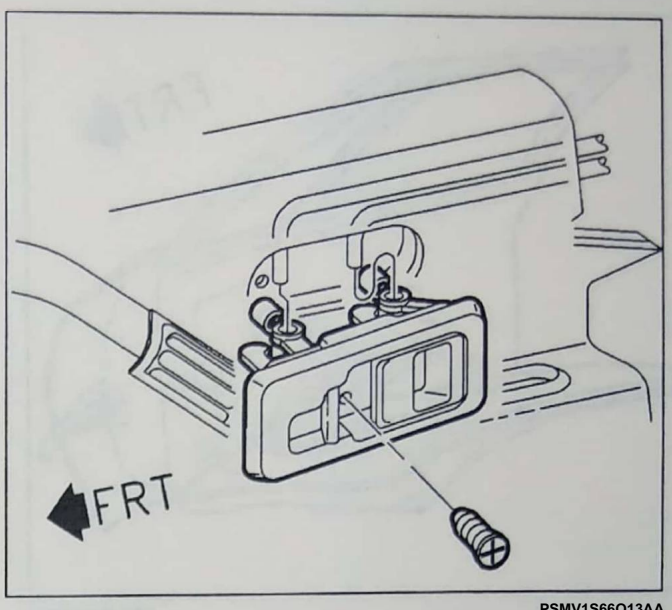
DOOR TRIM PANEL

REMOVAL

1. Remove screw from door handle and slide door handle assembly forward and outward.
2. Using a long thin screwdriver, disengage lock and latch rods from retainer.
3. Remove handle assembly.



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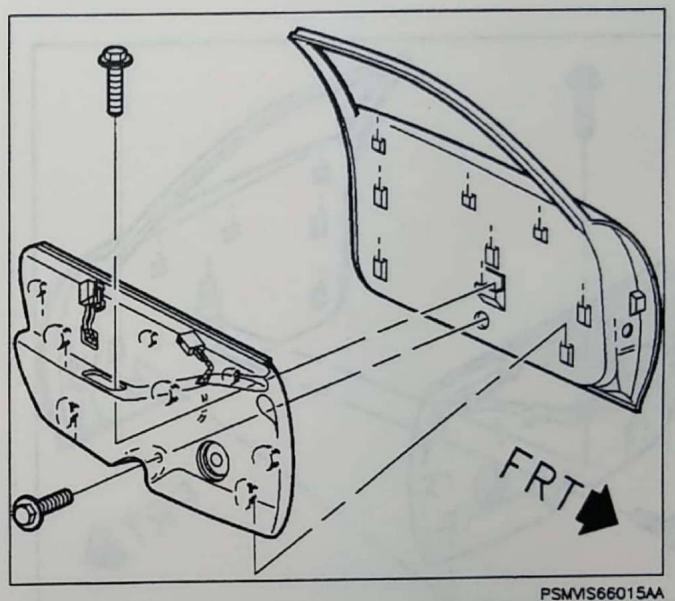
4. Remove screws from door pull cup.
5. Remove screws from bottom of the trim panel in the center.
6. Slide trim panel upward to release retainers.
7. Lift trim panel away from car slightly.



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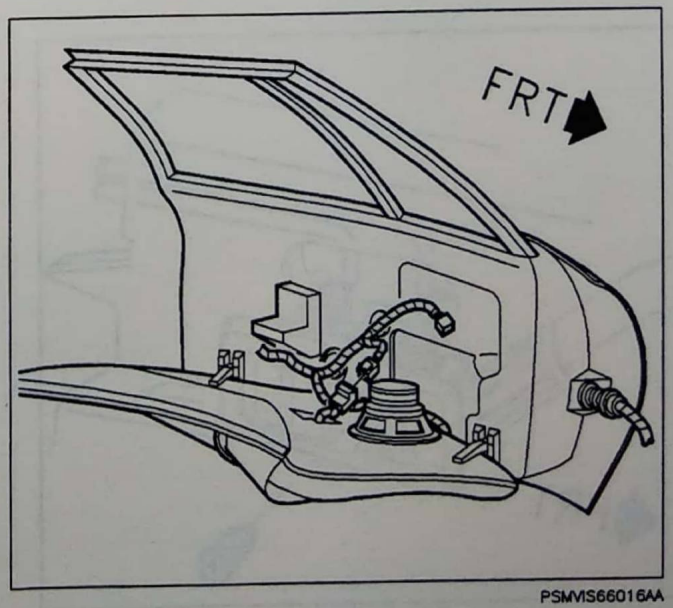
8. Disconnect inside door lock switch connector.
9. Disconnect outside remote mirror switch connector.
10. Disconnect front speaker connector.
11. Remove trim panel from car.



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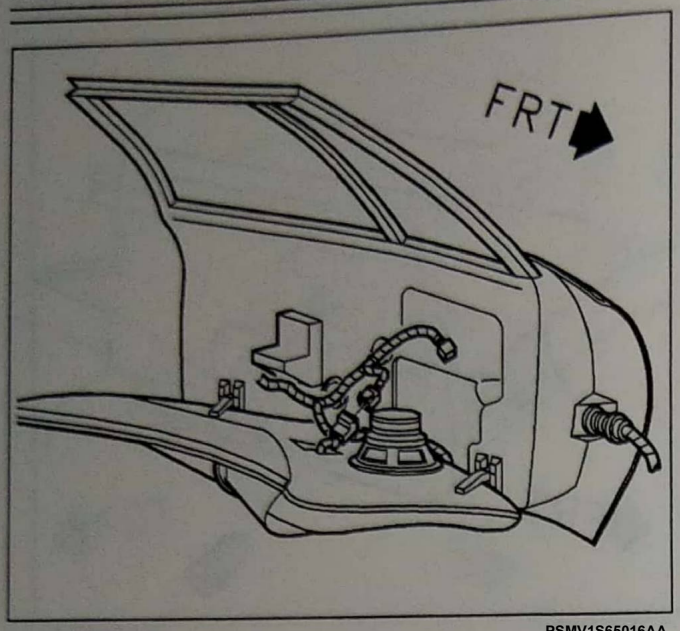

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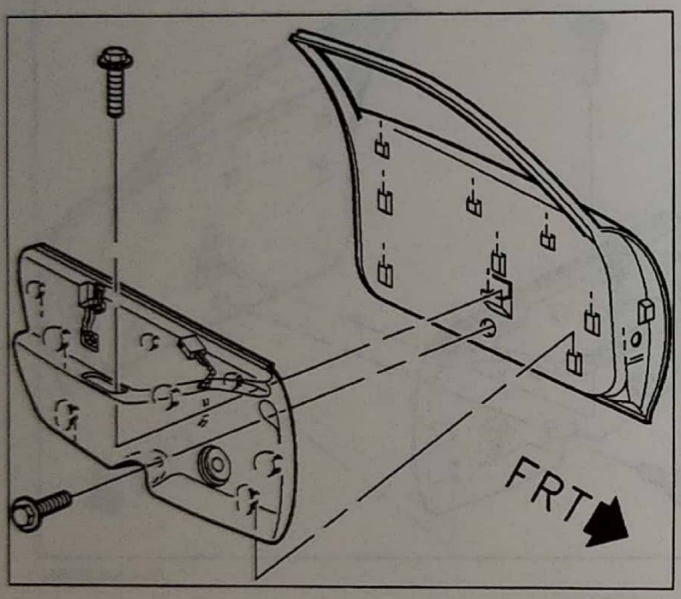
INSTALLATION

1. Connect front speaker connector.
2. Connect outside remote mirror switch connector
3. Connect inside door lock switch connector



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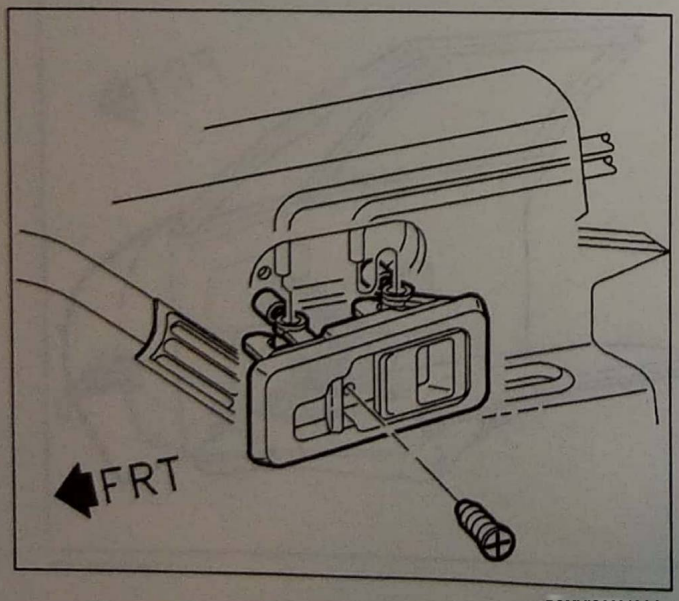
4. Align trim panel retainers to door inner panel and then slide trim panel down to engage retainers.
5. Install screw to bottom of trim panel in the center.

Torque: 1.5 N*m (13 in—lbs)

6. Install screws to door pull cup.

Torque: 1.9 N*m (17 in —lbs)



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7. Position door handle assembly into trim panel.
8. Tip handle outward at top. Lift latch and lock rods into retainers and latch retainer clamps.
9. Push handle into trim panel and slide rearward to engage tangs.
10. Install screw in handle. Tighten screw.

Torque: 1.5 N*m (13 in—lbs)

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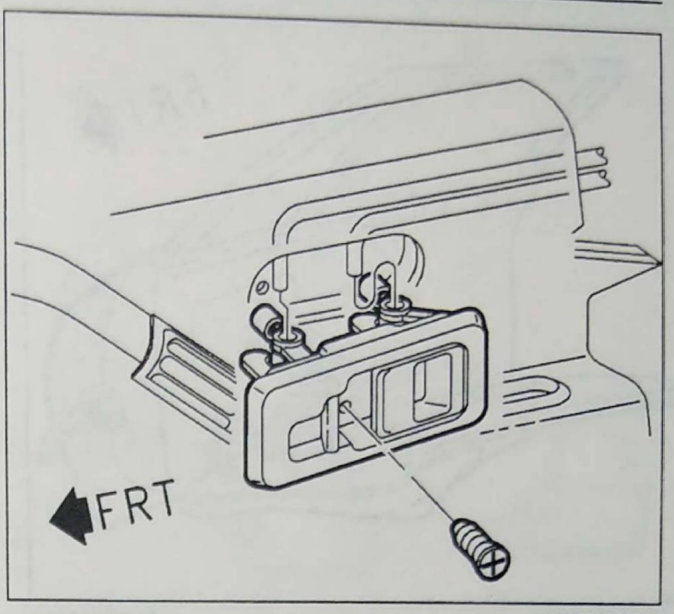
FRONT DOOR SPEAKER

REMOVAL

1 Remove screw from door handle and slide door handle assembly forward and outward.

2. Using a long thin screwdriver, disengage lock and latch rods from retainer.

3. Remove handle assembly.



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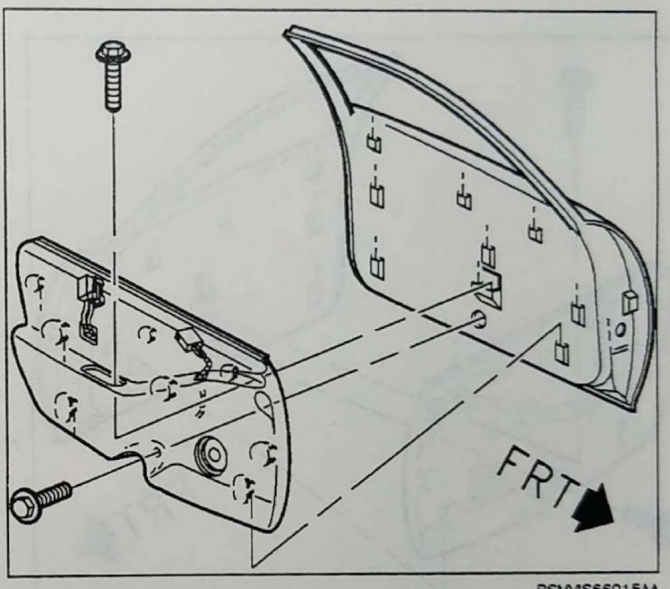
4. Remove screws from door pull cup.

5. Remove screws from bottom of the trim panel in the center.

6. Slide trim panel upward to release retainers.

7. Lift trim panel away from car slightly.



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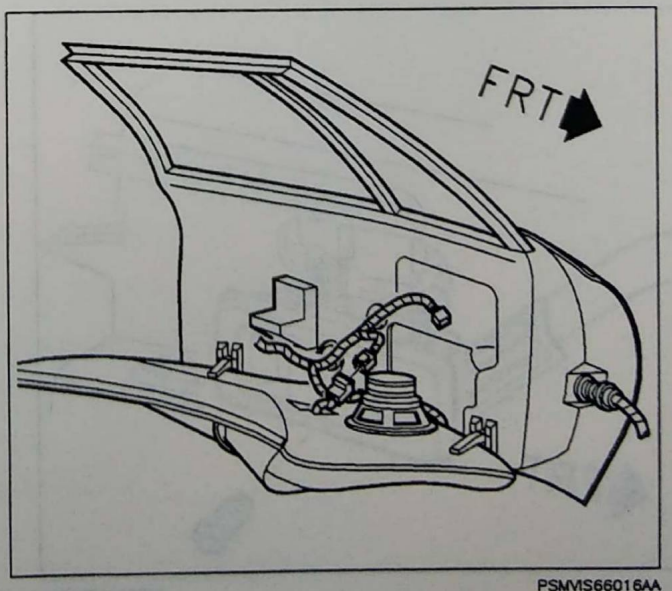
8. Disconnect inside door lock switch connector.

9- Disconnect outside remote mirror switch connector.

10. Disconnect front speaker connector.

11. Remove trim panel from car.



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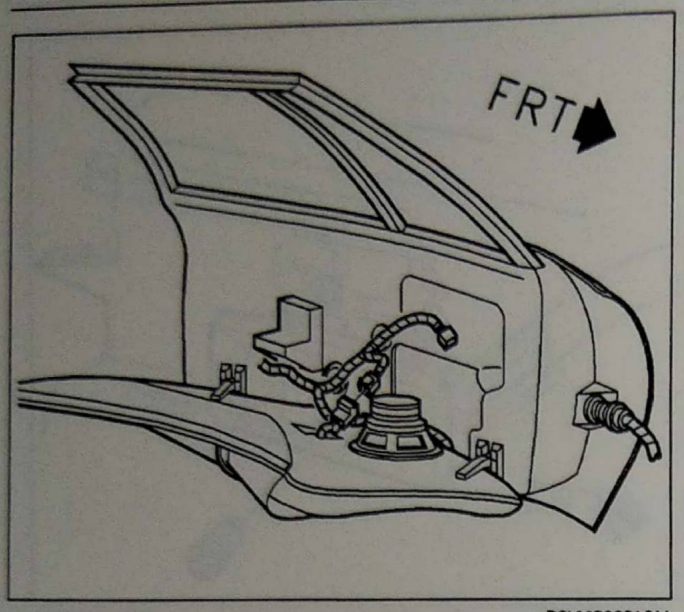

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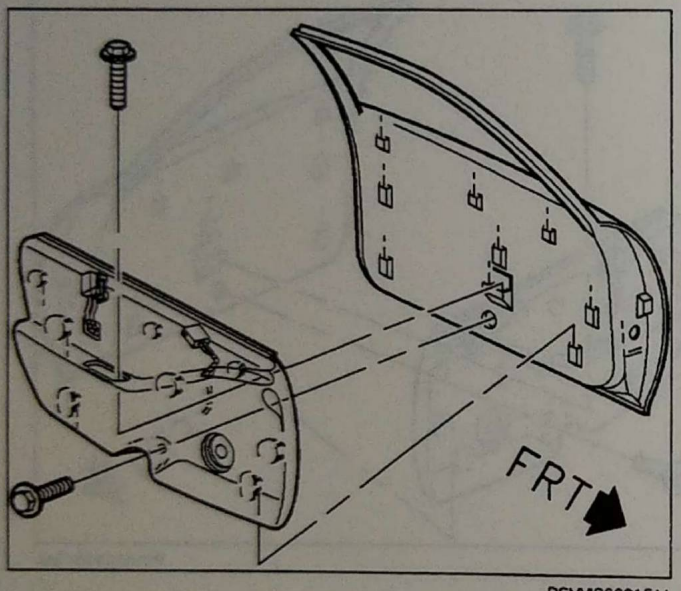

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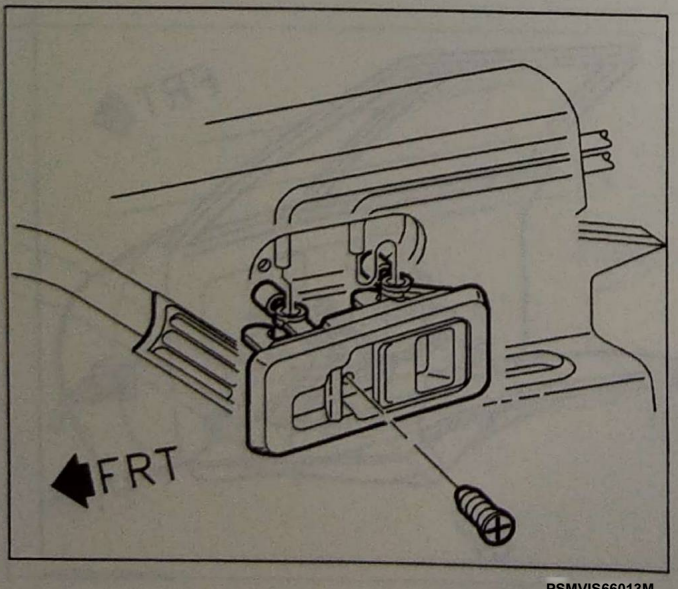

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12. Remove screws from speaker grille on the back side " of the door trim panel.
13. Remove speaker grille from door trim panel.

INSTALLATION

1. Align speaker grille to door trim panel.
2. Install screws from the back of the door trim panel to the speaker grille and tighten.

Torque: 1.5 N*m (13 in-lbs)

3. Connect front speaker connector.
4. Connect outside remote mirror switch connector.
5. Connect inside door lock switch connector.
6. Align trim panel retainers to door inner panel and then slide trim panel down to engage retainers.
7. Install screw to bottom of trim panel in the center.

Torque: 1.5 N»m (13 in —lbs)

8. Install screws to door pull cup.

Torque: 1.9 N«m (17 in-lbs)

9. Position door handle assembly into trim panel.
10. Tip handle outward at top. Lift latch and lock rods into retainers and latch retainer clamps.
11. Push handle into trim panel and slide rearward to engage tangs.
12. Install screw in handle. Tighten screw.

Torque: 1.5 N-m (13 in-lbs)

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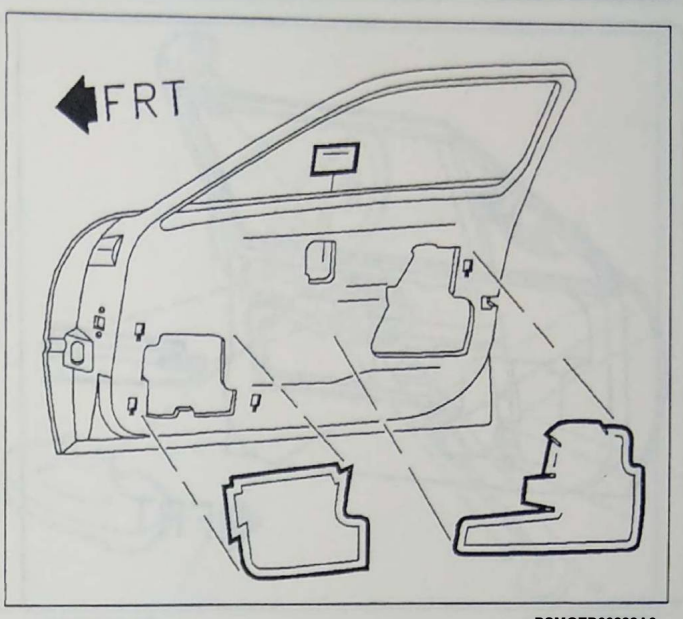
WATER DEFLECTORS

Whenever work is performed where the deflectors are disturbed, the deflectors must be properly resealed to the door inner panel to prevent waterleaks. For servicing seal, butvl adhesive is recommended if additional sealing material is required.

When access to the door inner panel is required to perform service operations, the deflectors may be completely or partially detached from the door inner panel. If the existing deflectors are damaged so that it will not seal the door assembly, replace the deflectors.

If only a partial access opening in the reflector is required, perform only the steps that are necessary to expose the required area of the door inner panel.



PSMGEP66282A3

REMOVAL

1. Remove interior trim panel. (Refer to “Interior Trim Panel” procedure in this manual.)
2. Break the sealer bond with a flat-bladed tool.
3. Peel water deflectors away from door inner panel.
4. Inspect deflectors for tears or holes. Repair using waterproof body tape on both sides of deflectors or replace deflectors.

INSTALLATION

1. Remove any loose or defective sealer from water deflectors.
2. Apply butyl tape to edges of water deflectors.
3. Align water deflectors with front and rear inside access holes.
4. Press firmly on butyl tape to secure water deflectors to inner side of door. Check entire perimeter of water defectors to ensure proper seal.

3- Install trim panel to door assembly. (Refer to “Interior Trim Panel” procedure in this manual.)

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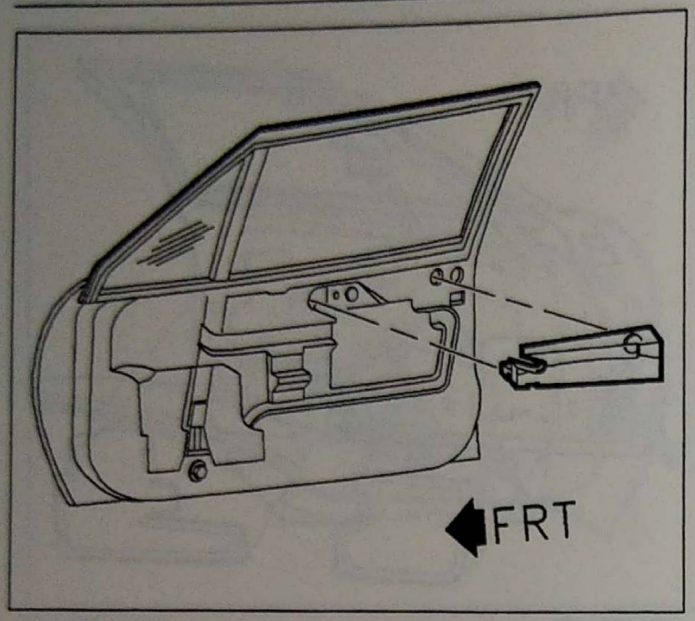

PSMGEP66099AA

DOOR INNER PANEL UPPER ENERGY ABSORBER

Front door energy absorbing foam is used to provide additional protection to the occupants of the vehicle during a collision. If the energy absorbing foam is removed from the door during service, it must be replaced or a new part installed.

REMOVAL

1. Remove front trim panel. (Refer to "Interior Trim Panel" procedure in this manual.)

CAUTION: THIS VEHICLE HAS ENERGY-ABSORBING FOAM BLOCKS FOR SIDE IMPACT PROTECTION. TO HELP AVOID PERSONAL INJURY IN A COLLISION, FOAM BLOCKS MUST BE RE-INSTALLED IF NOT DAMAGED. FOAM BLOCKS THAT ARE DAMAGED FROM A COLLISION OR DURING REPAIRS MUST BE REPLACED. FAILURE TO RE-INSTALL OR REPLACE FOAM BLOCKS THAT ARE REMOVED CAN VIOLATE FEDERAL LAW.

2. Carefully remove energy absorbing foam from front door structure.

INSTALLATION

1. Slide lock rod rearward.

CAUTION: THIS VEHICLE HAS ENERGY-ABSORBING FOAM BLOCKS FOR SIDE IMPACT PROTECTION. TO HELP AVOID PERSO INJURY IN A COLLISION, FOAM BLOCKS MUST BE RE-INSTALLED IF NOT DAMAGED. FOAM BLOCK^ THAT ARE DAMAGED FROM A COLLISION OR DURING REPAIRS MUST BE REPLACED. FAILU TO RE-INSTALL OR REPLACE FOAM BLOCKS TH ARE REMOVED CAN VIOLATE FEDERAL LAW

2. If ene... remnvT ...a^sor^ng foam was not damaged during ... install ... Automm ...® SCOTCH-MOUNT Super ...ive equivTlem H Attachment TaPe_ P/N 06380 (Or and inct n ...slOec* tape) to energy absorbing foam ... the en? to door structure. Make sure both ends of location^ absorb*nS foam are tucked into mounting ...

   If ener... removal ...foam was damaged during ... enerev ahJ damaged from a collision, install new ... both end ...orbing f...am to door structure. Make sure ...s of ... foam are tucked into_mountmii^oca^2.absSOrbinS

3. Install d... Panel" n?...r tL...m P.aneb (Refer to "Interior Trim ... procedure in this manual.)

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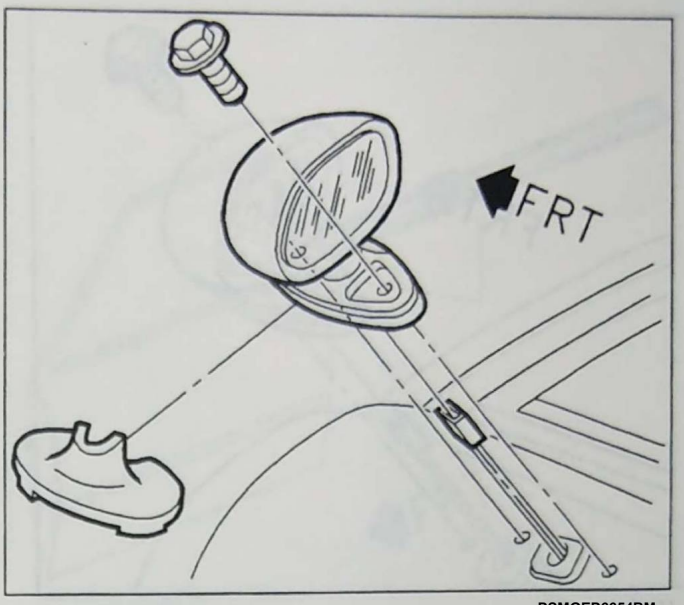
LEFT OUTSIDE REARVIEW MIRROR ASSEMBLY



PSMGEP6654BM

REMOVAL

1 Remove cover from base of outside rearview mirror assembly.

2 Remove minor retaining bolts.

; Disconnect door wiring harness connector from minor harness connector.

4. Secure door harness to outside panel of door with tape.

INSTALLATION

1. Connect minor harness to door harness. Push connector until fully and locked. Verify the connection is made, seated, and locked.

2. Install outside rear view minor to door and secure with bolts. Torque as specified.

Torque: 10 N*m (89 in—lbs)

3. Snap and lock cover over base of mirror.

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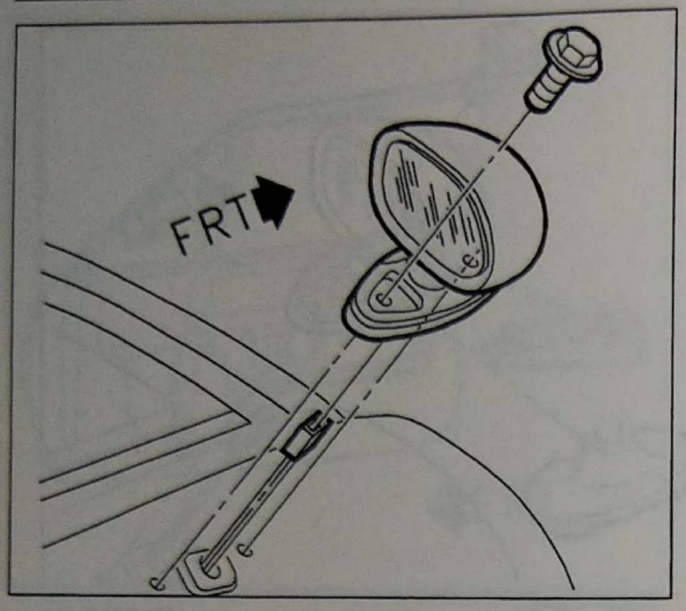

PSMGEP66748M

RIGHT OUTSIDE REARVIEW MIRROR ASSEMBLY

REMOVAL

1. Remove cover from base of outside rearview mirror assembly.
2. Remove mirror retaining bolts.
3. Disconnect door wiring harness connector from mirror harness connector.
4. Secure door harness to outside panel of door with tape.

INSTALLATION

1. Connect harness to door harness. Push connector until fully and locked. Verify the connection is made, seated, and locked.
2. Install outside rear view mirror to door and secure with bolts. Torque as specified.

Torque: 10 N*m (89 in —lbs)

3. Snap cover over base of mirror.

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DOOR OUTER SEALING STRIP (OUTER BELT MOLDING)

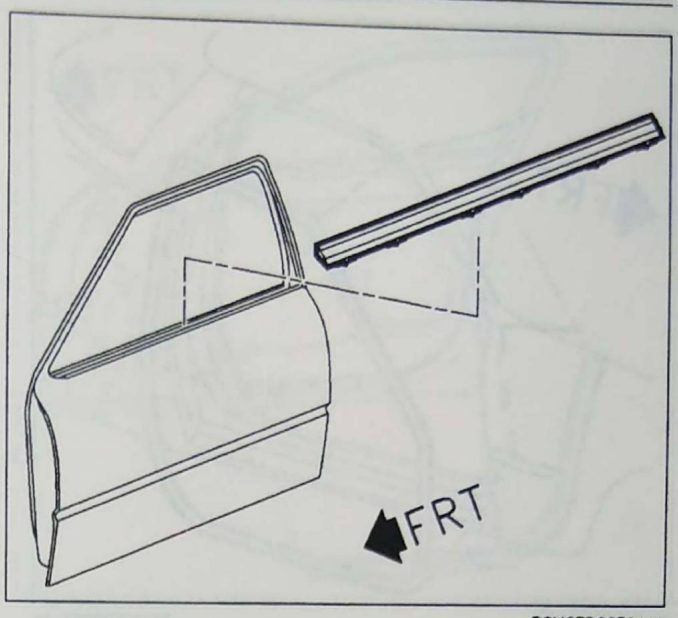
REMOVAL

] Lower window.

2 Remove sealing strip assembly by pulling upward to release spring clips.

INSTALLATION

1. Align spring clips to slots in door outer panel reinforcement and insert clips.
2. Push molding down to engage clips, being cautious not to distort door outer sealing strip.
3. Ensure that sealing strip assembly is seated flush to the door outer panel.



PSMGEP66591AA

WEATHERSTRIP-DOOR SECONDARY SEAL

REMOVAL

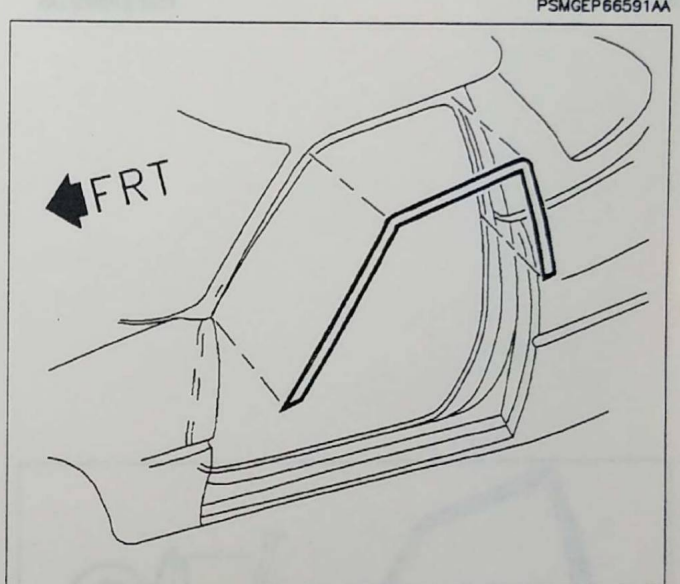
1. Hold heat gun at least 152mm (6 in.) from weatherstrip assembly.
2. Remove weatherstrip by pulling carefully from door inner frame.
3. Remove all traces of adhesive from inner door frame area with suitable solution of isopropyl alcohol (50/50 mixture by volume with water) or high—flash naptha.
4. Wipe area with clean dry cloth.

INSTALLATION

1. Wash affected area with soap and water and wipe dry.
2. If vehicle is below 21°C to 32°C (70°F to 90°F) due to shop temperature, warm the door inner frame with a heat gun before proceeding to step 3.
3. Align weatherstrip to scribe line on door frame pinchweld flange. Scribe line should be located 12 mm (1/2 in.) from edge of pinchweld.

IMPORTANT: Position weatherstrip carefully. Weatherstrip cannot be removed without reapplying adhesive after contact with door inner frame.

4- Position seal to door while peeling back protective tape. Follow scribe line until weatherstrip installation is complete.



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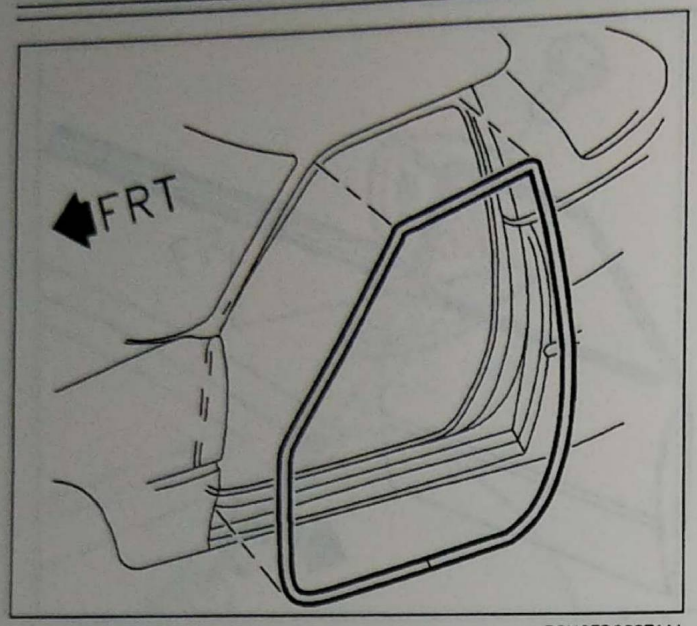

PSMGEP66071AA

WEATHERSTRIP-FRONT DOOR (PRIMARY SEAL)

SIDE~"

REMOVAL

1. Remove weatherstrip from door opening by starting at the seam (centered at the bottom of the door opening). Separate the joint, noting this position.
2. Beginning with one end, pull weatherstrip assembly slowly away from pinchweld flange, being careful not to allow sealer to contact trim components.

NOTICE: Clean old sealer from flange area.

3. continue until weatherstrip is completely removed from the pinchweld flange of body side door opening.

INSTALLATION

NOTICE- Inboard lip (on interior side) of weatherstrip is positioned over all interior trim pieces around perimeter of door opening.

1. Install weatherstrip to door opening.
2. Center seam in weatherstrip along the bottom edge *of* the door opening.
3. Install weatherstrip onto flange by first starting a small section at each of the four sides ensuring extra material is evenly split.
4. Finish installing weatherstrip by forcing extra material into the corners.
5. Ensure weatherstrip is fully engaged by using a plastic mallet to gently tap and seat weatherstrip onto flange.

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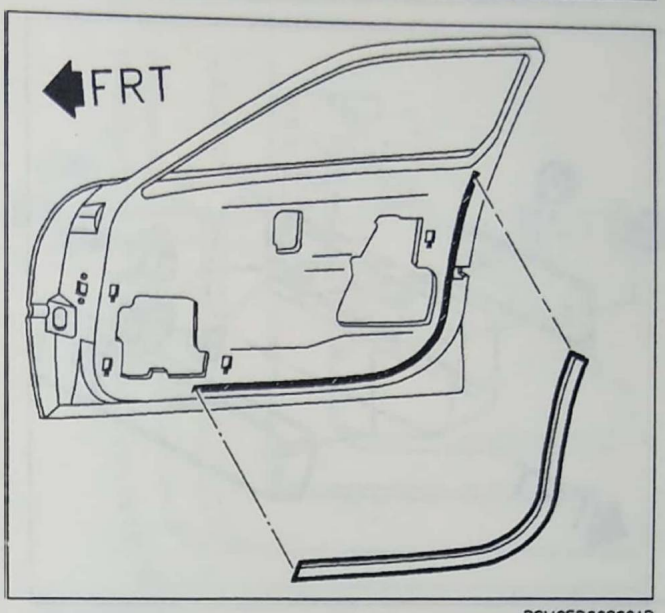
WEATHERSTRIP - FRONTSIDE DOOR AUXILIARY



PSMGEP66862AB

REMOVAL

1 Apply masking tape next to weatherstrip to mark location on door inner frame.

2. Hold heat gun at least 152 mm (6 in.) from weatherstrip assembly.

3. Remove weatherstrip by pulling carefully from door inner frame.

4. Remove all traces of adhesive from inner door frame area with suitable solution of isopropyl alcohol (50/50 mixture by volume with water) or high-flash naptha.

5. Wipe area with clean dry cloth.

INSTALLATION

1. Wash affected area with soap and water and wipe dry.

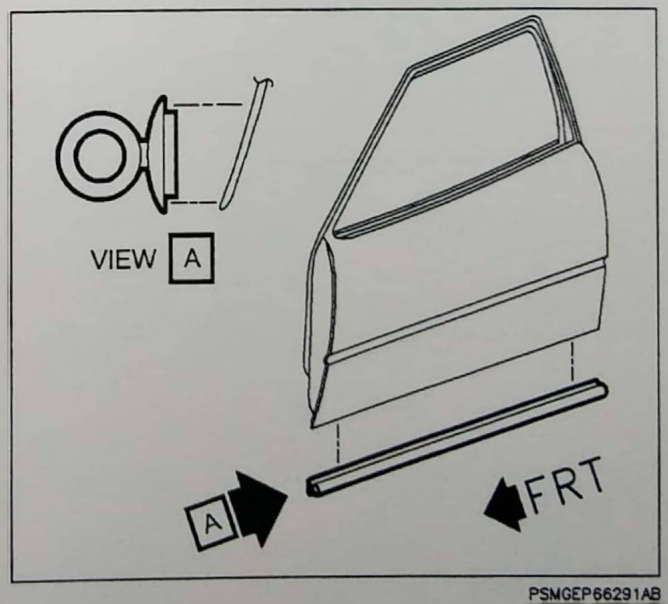
2. If vehicle body is below 21 to 32°C (70 to 90°F) due to shop temperature or outside temperature, warm the door inner frame with a heat gun before proceeding with step 3.

3. Align weatherstrip tape line on door inner frame and press firmly in place.

4. Remove masking tape from door inner frame.

IMPORTANT: Position weatherstrip carefully. Weatherstrip cannot be removed without reapplying adhesive after contact with door inner frame.

DOOR LOWER SEAL ASSEMBLY



PSMGEP66291AB

REMOVAL

1- Hold a heat gun at least 152 mm (6 in.) from sealing strip. Apply heat in an even and circular motion.

2. Pull sealing strip away from door assembly. A flat-bladed tool may be used, making sure not to damage paint.

INSTALLATION

1. Clean bonding area with suitable solution of isopropyl alcohol (50/50 mixture by volume with water) or high-flash naphtha.

2. Clean area with clean, dry cloth.

3. Heat door surface and adhesive side of new sealing strip. Temperature must be 35°C (95°F).

4. Remove protective liner from adhesive strip.

5. Position sealing strip carefully. Sealing strip cannot be removed without reapplying adhesive after contact with door.

6. Align sealing strip to locating feature starting at rear edge of door inner panel.

7. Press sealing strip into place and apply pressure along entire surface.

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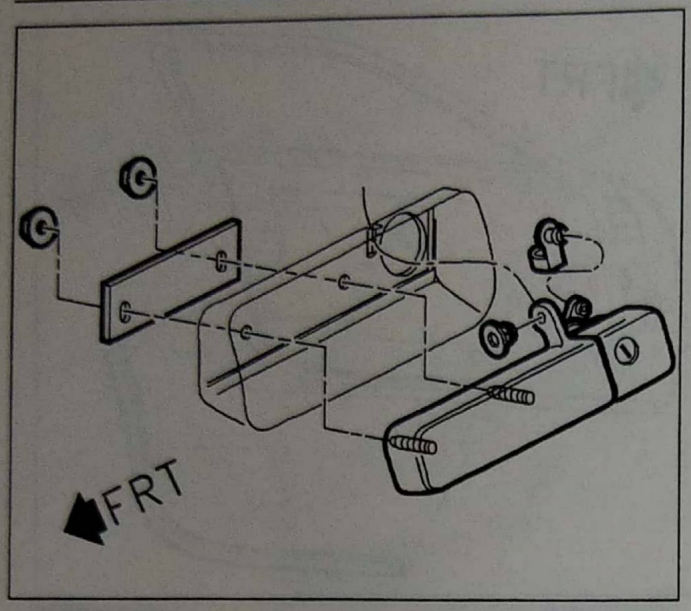

PSMGEP66323AA

OUTSIDE HANDLE ASSEMBLY

REMOVAL

1. Raise window to full upright position.
2. Remove interior trim panel. (Refer to “Interior Trim Panel” procedure in this manual.)
3. Remove rear water deflector from interior side of door assembly.
4. Remove lower bolt on rear window channel to move channel and access outside handle assembly retaining nuts.
5. Remove door outside handle retaining nuts through access holes of door inner panel.
6. Remove latch support bracket.
7. Remove rod from retainer at lock cylinder with flat blade screwdriver.
8. Remove rod from retaining clip on outside handle.
9. Raise handle and remove from door assembly.

INSTALLATION

1. Install handle and bracket to door and secure with nuts. Torque as specified.

Torque: 6 N*m (53 in—lbs)

2. Clip rod into lock cylinder retaining clip.
3. Clip rod into retaining clip on outside handle.
4. Test operation of lock cylinder and latch mechanism.
5. Install lower bolt on rear window channel. Torque as specified.

Torque: 4 N*m (35 in-lbs)

6. Install water deflector to inside of door assembly.
7. Install interior trim panel to door assembly. (Refer to “Interior Trim Panel” procedure in this manual.)

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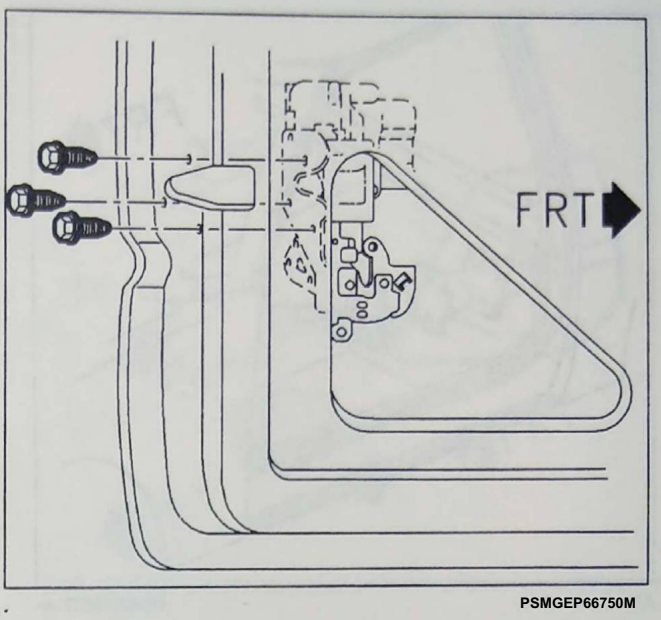
DOORLOCKASSEMBLY



PSMGEP66750M

REMOVAL

1 Remove interior trim panel. (Refer to “Interior Trim Panel’’ procedure in this manual.)

2 Remove water deflector from interior side of door assembly.

3. Remove rod from retainer at outside handle lock cylinder with flat blade screwdriver.

4. Remove rod from retaining clip on outside handle.

5. Remove lock rod and door handle rod from retaining clips on lock assembly.

6. Remove retaining bolts from lock assembly.

7. Remove lock assembly through rearward access hole in door inner panel.

8. Disconnect electric door harness connector from door lock two places.

INSTALLATION

1. Connect two door harness electrical connectors to power door lock mechanism. Verify connection is made, seated, and locked.

2. Install lock through rear access hole in door inner panel.

3. Connect lock rod and door handle rod from inside door handle to lock assembly. Verify operation of door handle/lock rod prior to closing doors.

4. Install lock to door with retaining bolts. Torque as specified.

Torque: 10 N*m (89 in-Ibs)

5. Install lock rod to retainer clip on outside handle.

6. Install lock rod to retainer clip on lock cylinder.

T Install water deflector to inside of door assembly.

8. Install interior trim panel to door assembly. (Refer to “Interior Trim Panel” procedure in this manual.)

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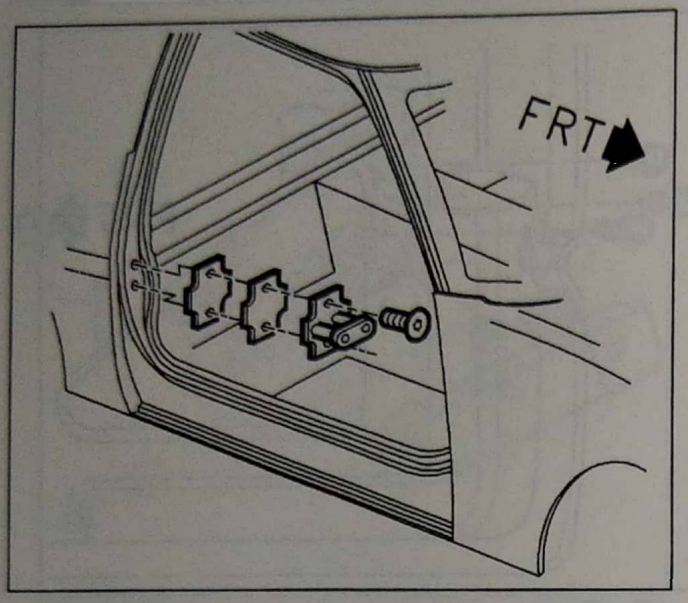


PSMGEP66077M

DOOR LOCK STRIKER ASSEMBLY

REMOVAL

1. Mark position of striker with soft marker for installation.
2. Remove retaining bolts/screws.
3. Remove striker assembly, spacers, and washer.

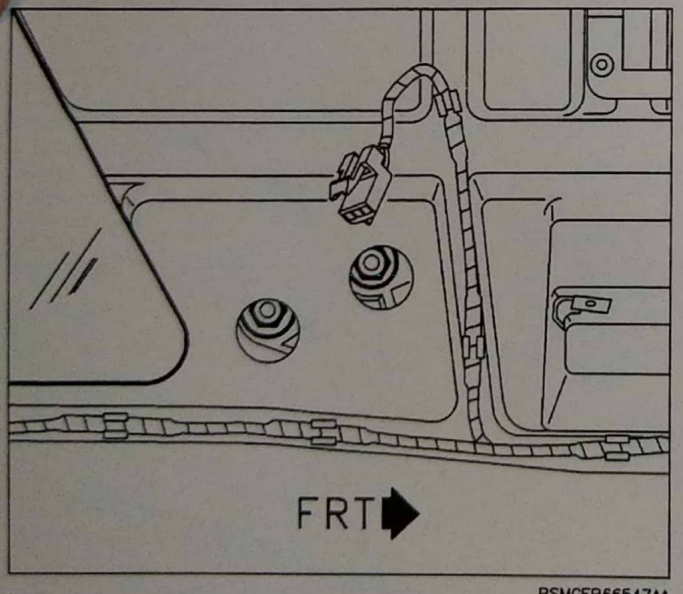
INSTALLATION

1. Loose install striker assembly, spacer, and washer to positioned mark on body with bolts/screws.

IMPORTANT: Door assembly must be properly aligned before adjusting the striker assembly.

2. Close door assembly while holding outside handle assembly in open position. Check striker assembly-to-lock assembly engagement.
3. Check that striker assembly is centered forward and rearward in lock assembly opening. Add or remove shims as needed.
4. Adjust striker assembly up or down and inboard or outboard, as required.
5. Torque bolts/screws as specified.

Torque: 23 N*m (17 ft—lbs)



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DOOR WINDOW

REMOVAL

1. Remove interior trim panel. (Refer to ‘Interior Trim Panel” procedure in this manual.)
2. Remove water deflectors from interior side of door assembly.
3. Lower window such that door window regulator mounting bracket is in line with access holes in door inner.

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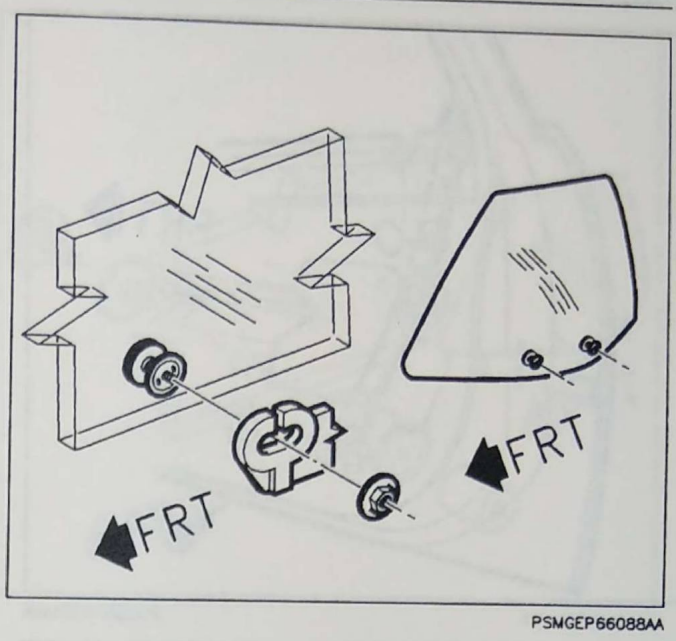
4. Remove window retaining nuts and slide window away from bracket. A soft rubber door stop may be temporarily wedged between the top of the window and door frame to hold window in place

CAimON: APPROVED SAFETY GLASSES AND GLOATS SHOULD BE WORN WHEN PERFORMING THESE PROCEDURES TO REDUCE THE CHANGF OF PERSONAL INJURY SHOULD WINDOW BREAKAGE OCCUR.



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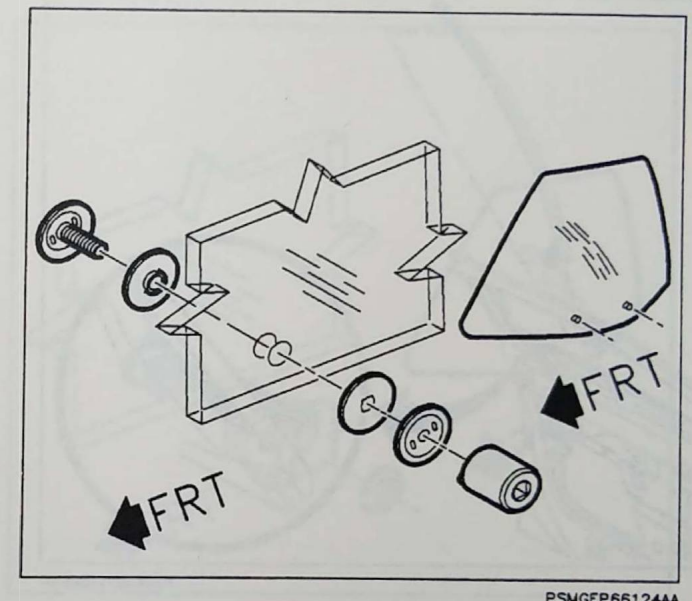
5. Remove bushing assemblies and retainers with tool EV9702B.



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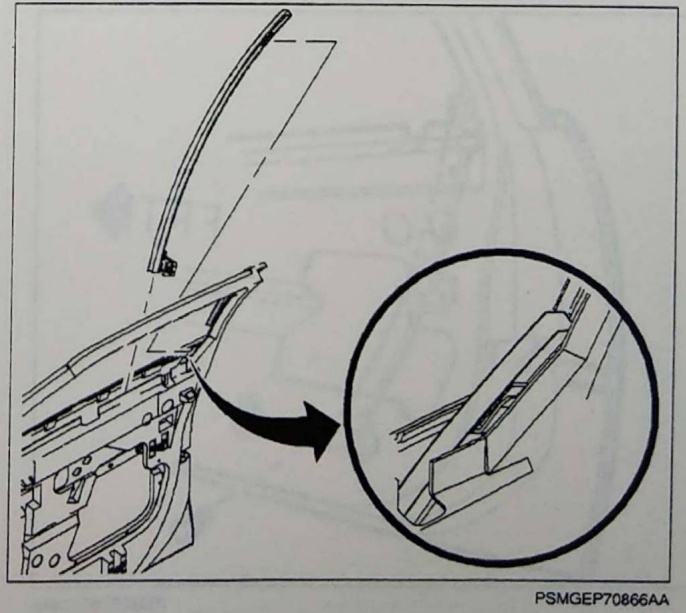
6. Remove rear window channel retaining bolt. Slide upper part of bracket from under clip.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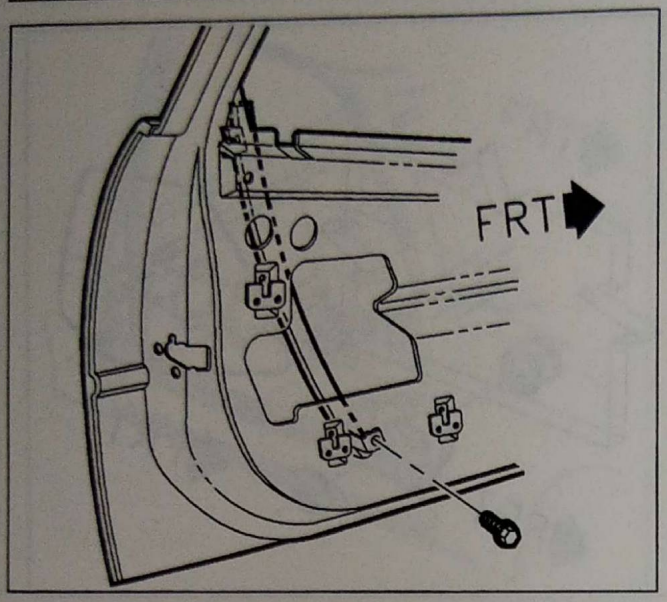

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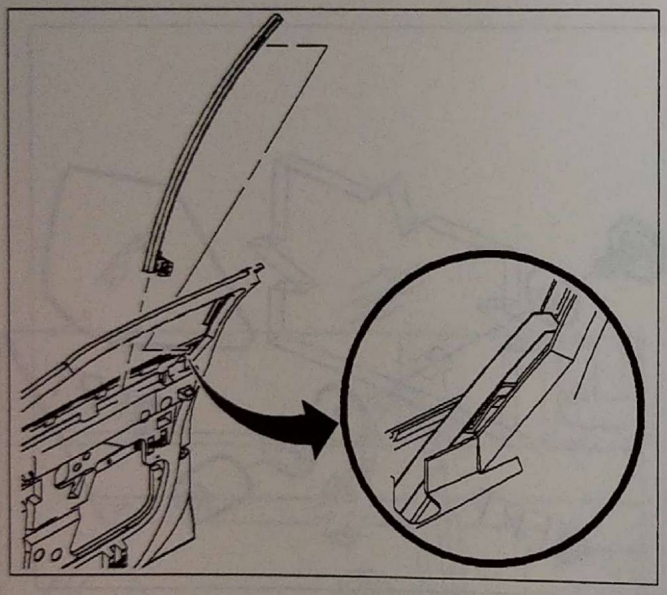

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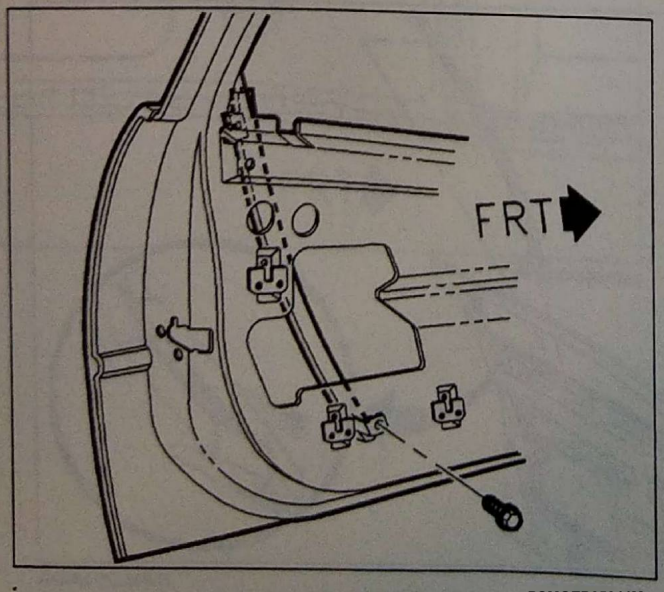


PSMGEP65644M

7. Remove weatherstrip from channel. Rotate and remove channel through rearward access hole in door inner panel.
8. Push door glass up and rotate slightly. Remove door glass from door assembly.

INSTALLATION

CAUTION: APPROVED SAFETY GLASSES AND GLOVES SHOULD BE WORN WHEN PERFORMING THESE PROCEDURES TO REDUCE THE CHANCE OF PERSONAL INJURY SHOULD WINDOW BREAKAGE OCCUR.

1. Install door glass into door assembly.

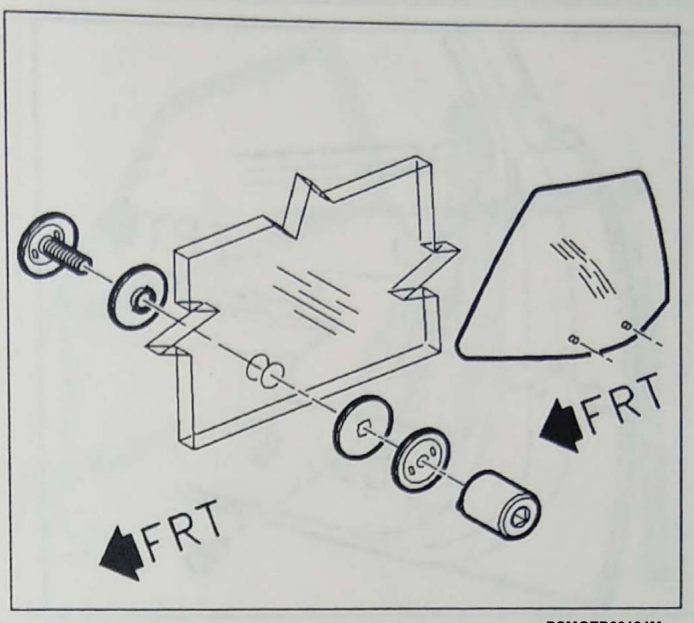
IMPORTANT: For ease of installation, apply liquid soap to rear window channel and weatherstrip prior to installation.

2. Install rear window channel to door. Slide upper bracket under retaining clip. Install weatherstrip to rear window channel.

3. Position glass in front and rear channels. Install channel to door with retaining bolt.

Torque: 4 N•m (35 in−lbs)

tall bushing and retainer assemblies using tool
EV?702B.



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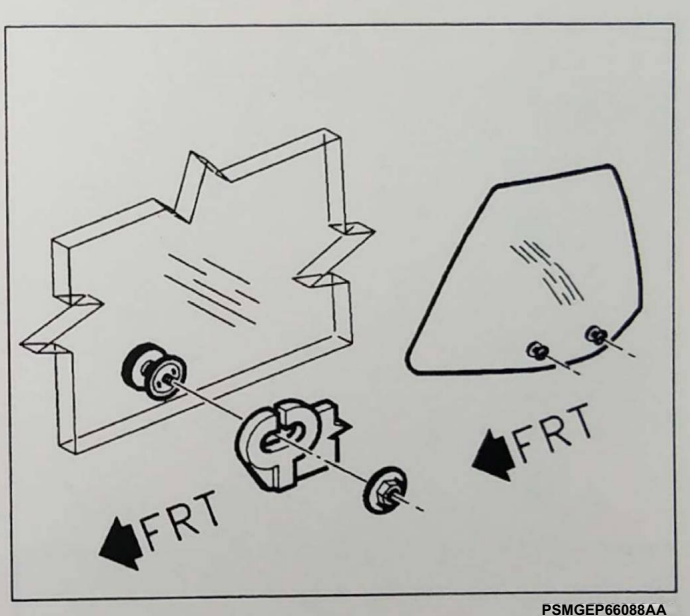
5. Lower window such that door window regulator mounting bracket is in line with retaining studs on window. Install window retaining nuts. Torque as specified.

Torque: 8 N*m (71 in-lbs)

6. Test operation of window assembly and adjust as needed. (Refer to "Door Window Adjustment'' in this manual.)

L Install water deflectors to inside of door assembly.

8. Install interior trim panel to door assembly. (Refer to 'Interior Trim Panel" procedure in this manual.)



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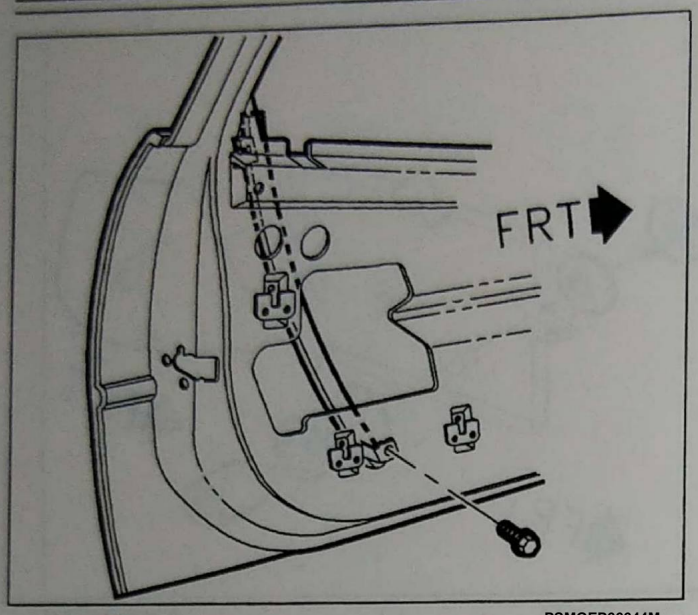

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REAR WINDOW CHANNEL

REMOVAL

1. Raise window to full upright position.
2. Remove interior trim panel. (Refer to “Interior Trim Panel” procedure in this manual.)
3. Remove door applique. (Refer to “Door Applique” procedure in this manual.)
4. Remove water deflector from interior side of door assembly.
5. Remove door window assembly. (Refer to “Door Window” procedure in this section.)
6. Remove window channel retaining bolt. Slide upper bracket from under clip.
7. Remove weatherstrip from channel.
8. Rotate and remove channel through rear access hole in door inner panel.

INSTALLATION

1. Install door window assembly. (Refer to “Door Window” procedure in this manual.)
2. Install window channel to door.
3. Slide upper bracket under retaining clip.

IMPORTANT: For ease of installation, apply liquid soap to rear window channel and weatherstrip prior to installation.

4. Install weatherstrip to window channel.
5. Engage window into front and rear channels.
6. Install rear window channel retaining bolt. Torque as specified.

Torque: 4 N«m (35 in-lbs)

7. Install interior trim panel. (Refer to “Interior Trim Panel” procedure in this manual.)
8. Install door applique. (Refer to “Door Applique” procedure in this manual.)

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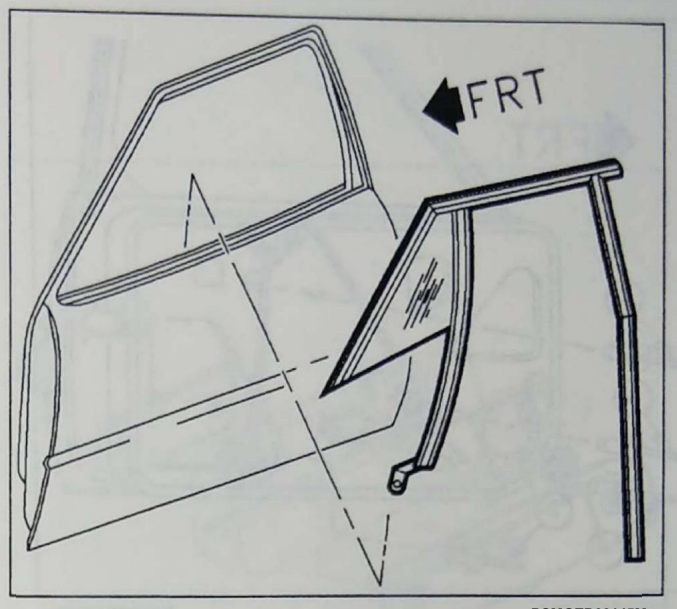
STATIONARY WINDOW ASSEMBLY



PSMGEP66145M

REMOVAL

1 Remove interior trim panel. (Refer to “Interior Trim Panel" procedure in this manual.)

2 Remove water deflectors. (Refer to “Water Deflector" procedure in this manual.)

3. Remove door glass assembly. (Refer to “Door Glass” procedure in this manual.)

4. Remove bolt retaining stationary window assembly to door frame.

5. Carefully pull stationary window outboard in door frame and remove from door assembly.

INSTALLATION

IMPORTANT: Use soap solution of one part mild detergent and five parts water to aid in the installation of seal to door window frame.

1. Insert stationary window assembly into door frame.

2. Install window weatherstrip to door frame starting at front lower comer using plastic paddle and soap/water solution.

3. Align front upper corner of weatherstrip to window frame and secure working towards starting position.

4. Align rear upper corner of weatherstrip to window frame and finish operation.

5. Install door glass to stationary glass and guide channel.

6. Install bolt retaining rear guide channel to door frame assembly and adjust window accordingly.

7 • Install bolt retaining stationary window assembly to door frame.

8- Install water deflectors. (Refer to “Water Deflector” procedure in this manual.)

9- Install interior trim panel. (Refer to “Interior Trim Panel” procedure in this manual.)

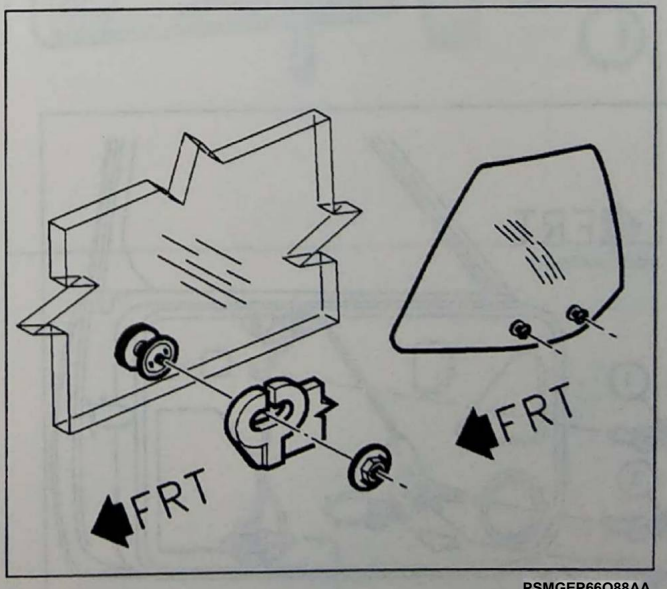
WINDOW ALIGNMENT

1 Remove interior door trim panel. (Refer to “Interior Trim Panel” procedure in this manual.)

2. For window front to back adjustment, loosen bolts and adjust window channel as necessary.

3- For window tilt adjustment, loosen window regulator bracket nuts and adjust window position as necessary,

4. install interior door trim panel. (Refer to “Interior Trim Panel” procedure in this manual.)



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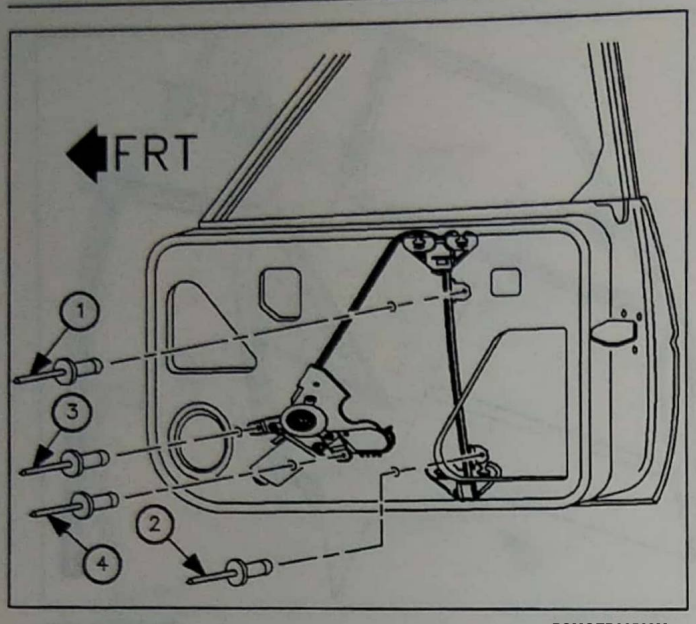

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WINDOW REGULATOR

REMOVAL

CAUTION: APPROVED SAFETY GLASSES AND GLOVES SHOULD BE WORN WHEN PERFORMING THESE PROCEDURES TO REDUCE THE CHANCE OF PERSONAL INJURY SHOULD WINDOW BREAKAGE OCCUR.

1. Remove interior trim panel. (Refer to "Interior Trim Panel" procedure in this manual.)
2. Remove water deflector from interior side of door assembly.
3. Lower door window regulator bracket such that mounting bracket is in line with access holes in door inner. Remove window retaining nuts and slide window away from bracket.

CAUTION: APPROVED SAFETY GLASSES AND GLOVES SHOULD BE WORN WHEN PERFORMING THESE PROCEDURES TO REDUCE THE (HANC E OF PERSONAL INJURY SHOULD WINDOW BREAKAGE OCCUR.

4. Push window up and support in position by inserting rubber door stops at front and rear of window between window and door inner panel.
5. Push rivet mandrel out of rivet (four locations) with a punch. Drill out rivets and remove rivet fragment from holes.
6. Disconnect electrical connector from motor/regulator assembly by sliding assembly forward to front access hole in door.
7. Remove regulator with motor assembly attached through rear access hole.

INSTALLATION

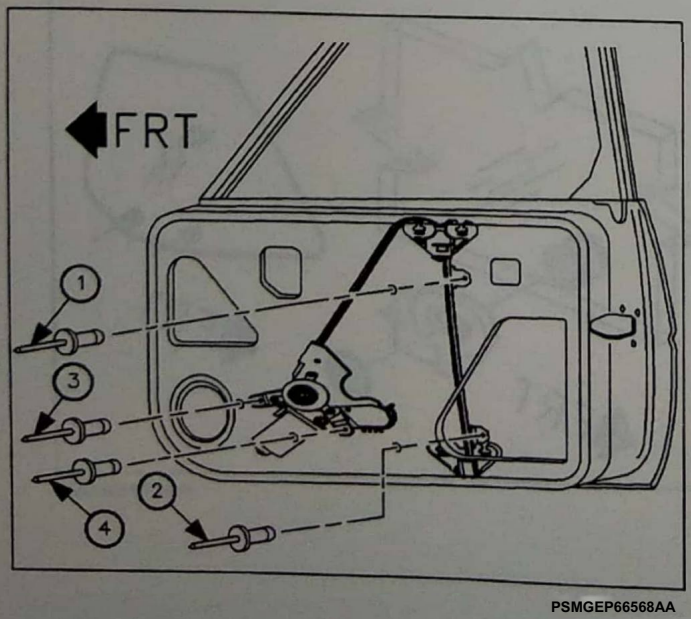
1. Install regulator assembly, with motor assembly attached, through rear access hole.
2. Connect electrical connector to motor assembly.
3. Install rivets in sequence shown.

CAUTION: APPROVED SAFETY GLASSES AND GLOVES SHOULD BE WORN WHEN PERFORMING THESE PROCEDURES TO REDUCE THE CHANCE 2£JERSONAL IN**JURY SHOULD WINDOW** BREAKAGE OCCUR.

4. Lower door window regulator bracket such that mounting bracket is in line with access holes in door inner panel.
5. Lower door window and align door window regulator bracket with two studs on window. Install window retaining nuts. Torque as specified.

Torque: 8 N«m (7 in-lbs)

6. Test regulator and window for proper operation and alignment and adjust accordingly.



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- Install water deflector to inside of door assembly.

s install interior trim panel to door assembly. (Refer to "interior Trim Panel-" procedure in this manual.)

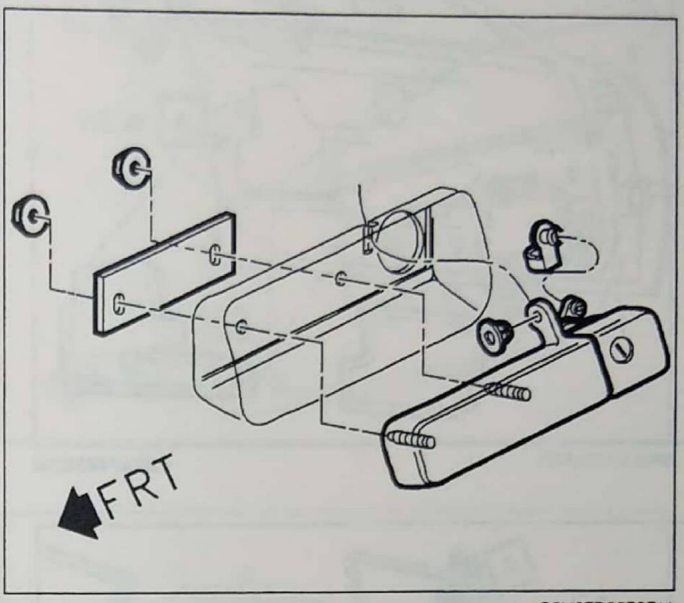
LOCK CYLINDER

REMOVAL

j Raise window to full upright position.

; Remove interior trim panel. (Refer to "Interior Trim Panel" procedure in this manual.)

3. Remove rear water deflector from interior side of door assembly.
4. Remove outside door handle retaining nuts through access holes of door inner panel.
5. Remove latch support bracket.
6. Remove rod from retainer at lock cylinder with flat blade screwdriver.
7. Remove rod from retaining clip on outside handle.
8. Raise handle and remove from door assembly.
9. Remove clip and lock cylinder from handle.



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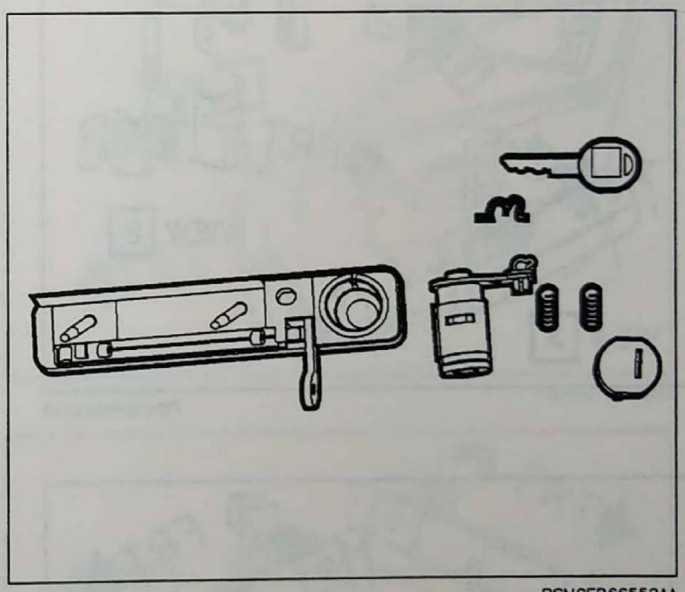
INSTALLATION

1. Install lock cylinder into handle. Secure with retaining clip.
2. Locate outside handle to door.
3. Install mounting bracket and retaining nuts to handle. Torque as specified.

Torque: 6 N*m (53 in —lb)

4. Install lock release rod and clip.
5. Install lock rod to lock cylinder assembly.
6. Install water deflector to interior side of door assembly.

7- Install interior trim panel. (Refer to "Interior Trim Panel" procedure in this manual.)



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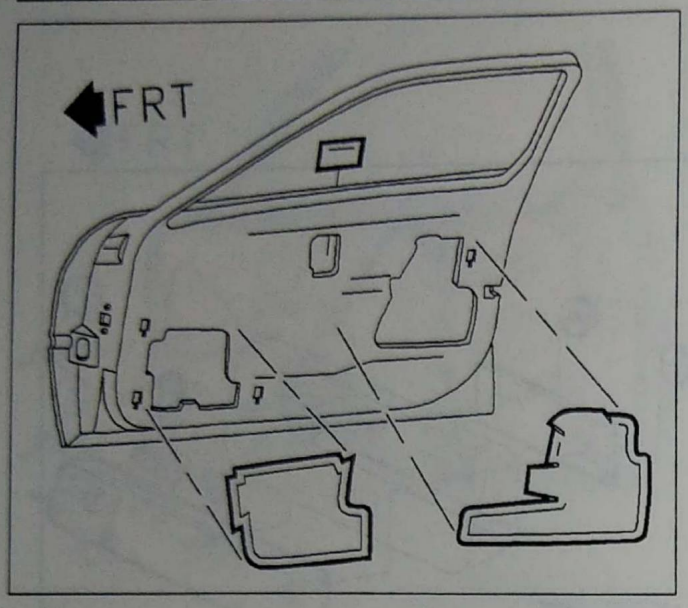

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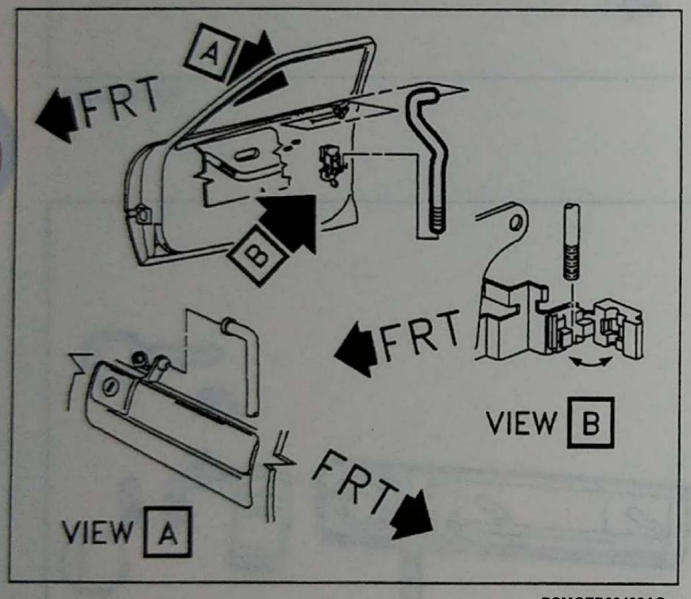

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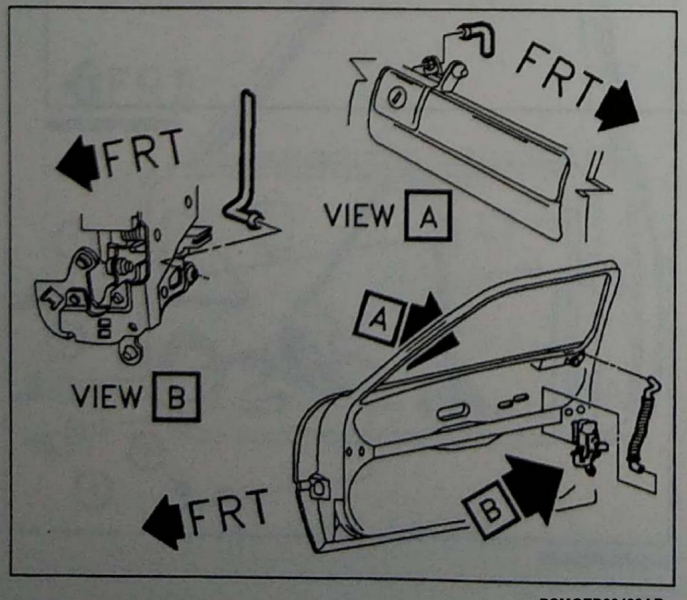

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LOCK RODS AND DOOR HANDLE RODS

REMOVAL

1. Remove interior trim panel. (Refer to “Interior Trim Panel” procedure in this manual.)

CAUTION: THIS VEHICLE HAS ENERGY-ABSORBING FOAM BLOCKS FOR SIDE IMPACT PROTECTION. TO HELP AVOID PERSONAL INJURY IN A COLLISION, FOAM BLOCKS MUST BE RE-INSTALLED IF NOT DAMAGED. FOAM BLOCKS THAT ARE DAMAGED FROM A COLLISION OR DURING REPAIRS MUST BE REPLACED. FAILURE TO RE-INSTALL OR REPLACE FOAM BLOCKS THAT ARE REMOVED CAN VIOLATE FEDERAL LAW.

2. Remove door inner panel upper energy absorber. (Refer to “Door Inner Panel Upper Energy Absorber” procedure in this manual.)
3. Remove water deflectors from interior side of door assembly.
4. Cycle glass to full up position.
5. Remove rod from outside door handle assembly and lock/latch mechanism.
6. Remove rod from outside door handle lock cylinder and lock/latch mechanism.

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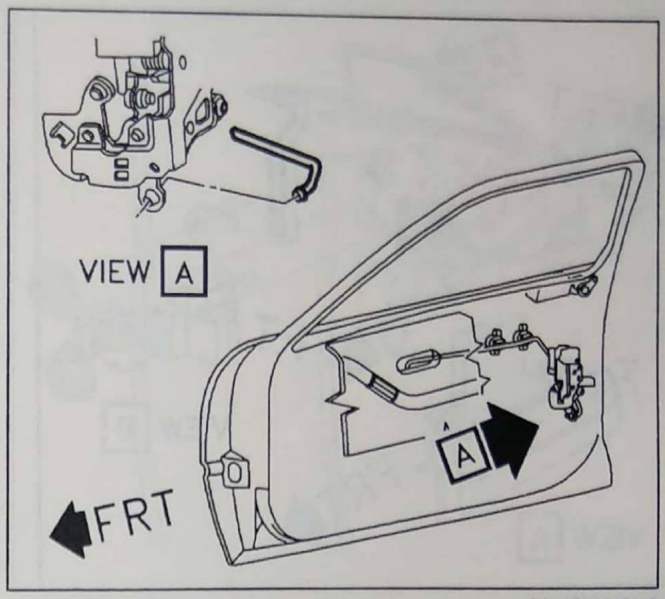
7. Remove door open rod from guide and lock mechanism.



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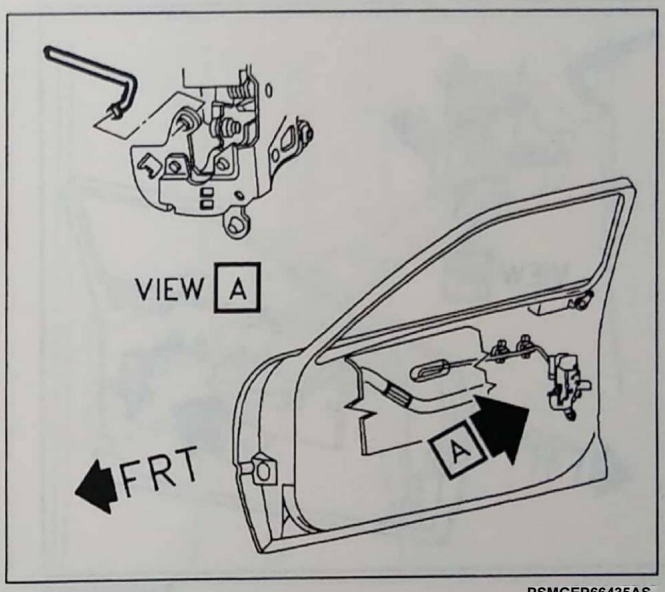
8. Remove rod from outside door handle assembly and lock/latch mechanism.



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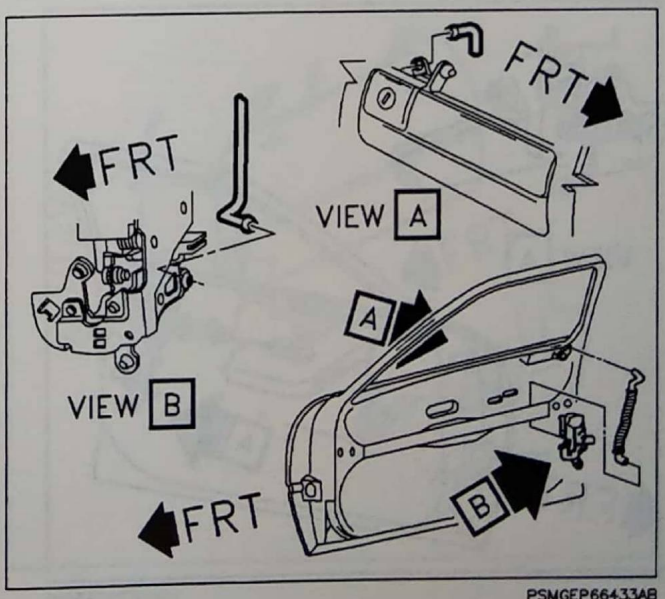
INSTALLATION

1. Install rod to lock cylinder and lock/latch mechanism. Rod should be installed on outboard of side impact beam.



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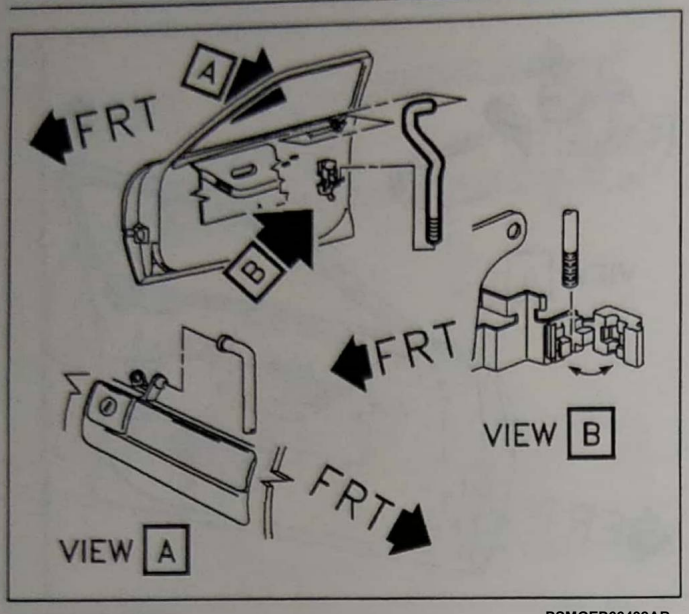

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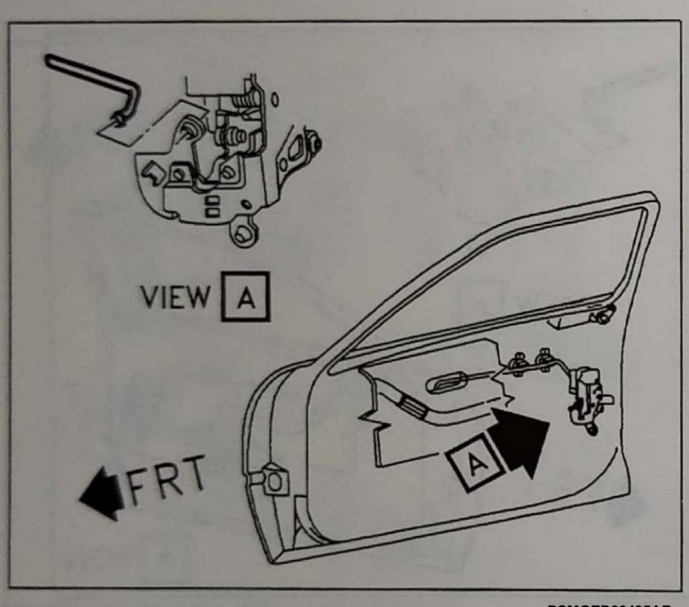
2. Install rod to outside door handle and clip into retainer of lock/latch mechanism. Outside door handle rod length should be adjusted so associated lock lever is in a relaxed state.



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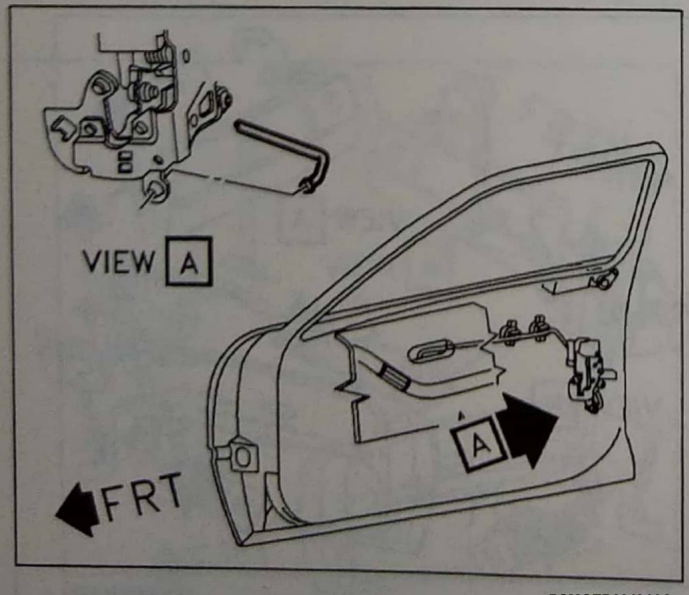
3. Install lock rod to lock/latch mechanism. Snap rod into guide.
4. Install latch rod to lock latch mechanism. Snap rod into guide.
5. Install water deflectors to inside of door assembly.

CAUTION: THIS VEHICLE HAS ENERGY-ABSORBING FOAM BLOCKS FOR SIDE IMPACT PROTECTION. TO HELP AVOID PERSONAL INJURY IN A COLLISION, FOAM BLOCKS MUST BE RE-INSTALLED IF NOT DAMAGED FROM A COLLISION OR DURING REPAIRS MUST BE REPLACED. FAILURE TO RE-INSTALL OR REPLACE FOAM BLOCKS THAT ARE REMOVED CAN VIOLATE FEDERAL LAW.



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6. Install door inner panel upper energy absorber. (Refer to “Door Inner Panel Upper Energy Absorber” procedure in this manual.)
7. Install interior trim panel to door assembly. (Refer to "Interior Trim Panel” procedure in this manual.)

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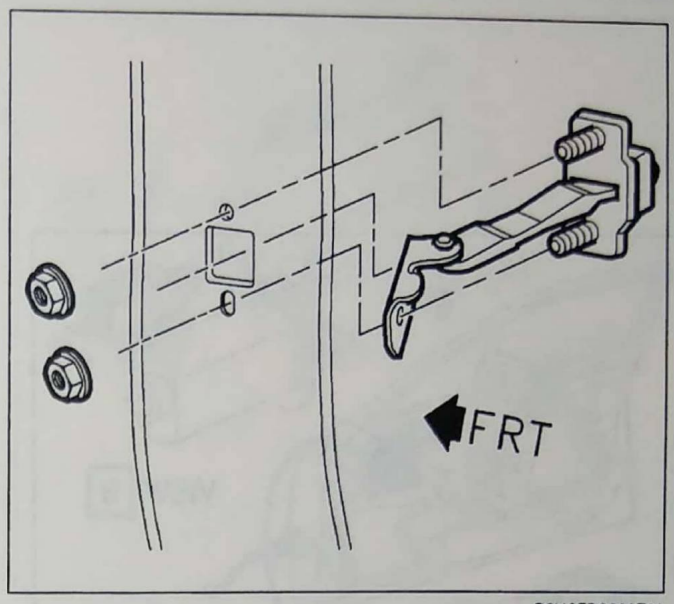
CHECK LINK

REMOVAL

1 Remove interior trim panel. (Refer to “Interior Trim Panel" procedure in this manual.)

2. Remove front water deflector from interior side of door assembly.



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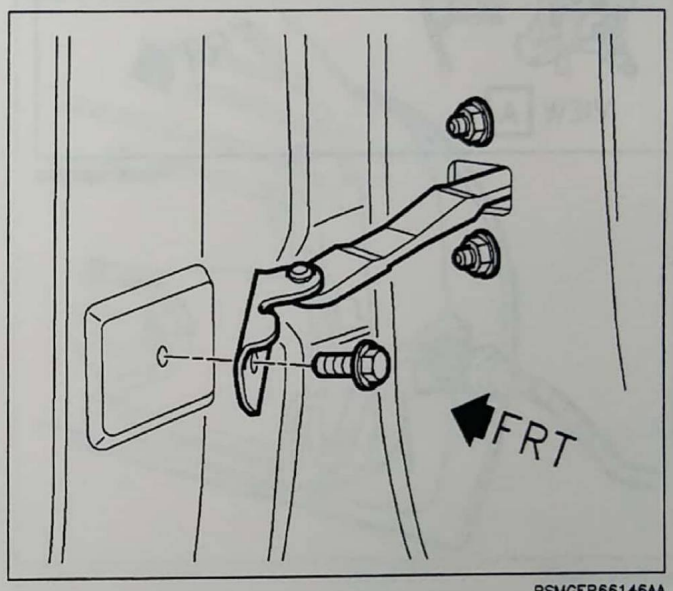
3. Remove retaining nuts from door assembly and one retaining bolt from the hinge pillar mounting location.

4. Remove check link through front access hole located in door assembly.



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INSTALLATION

1. Install check link to door with retaining nuts. Torque as specified.

Torque: 7N*m (62 in-lbs)

2. Install check link to hinge pillar with retaining bolt. Torque as specified.

Torque: 25 N*m (19 ft-lbs)

3. Check door operation and check link hold-open characteristics.

4. Install water deflectors to inside of door assembly.

5- Install interior trim panel to door assembly. (Refer to ‘‘Interior Trim Panel” procedure in this manual.)

HINGE ASSEMBLY

REMOVAL

IMPORTANT: Using this procedure, remove only one hinge at a time.

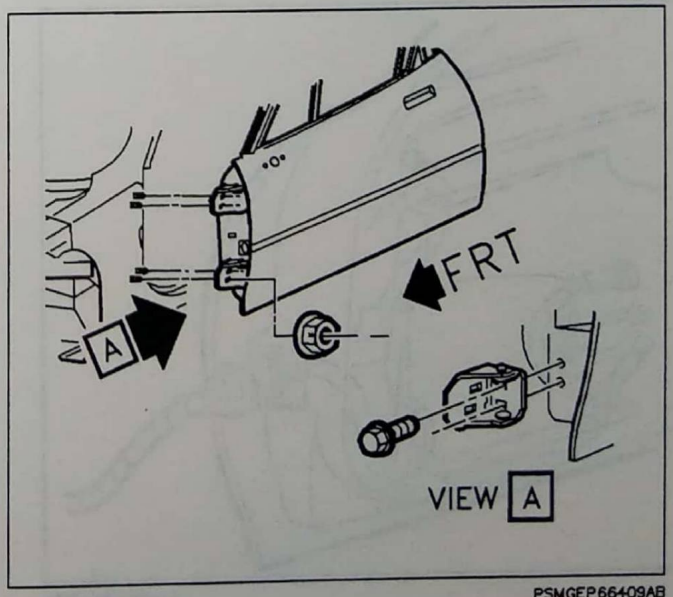
1. Support door assembly in full open position.

2. Mark outside position of hinge on door assembly and hinge pillar with a soft marker for installation.

3- Remove hinge to door bolts.

4* Remove retaining nuts to hinge pillar studs.

5- Remove hinge assembly.



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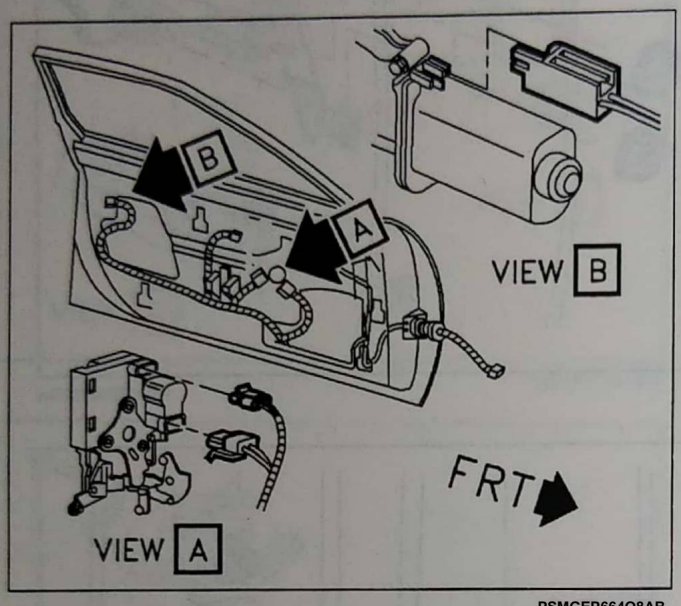

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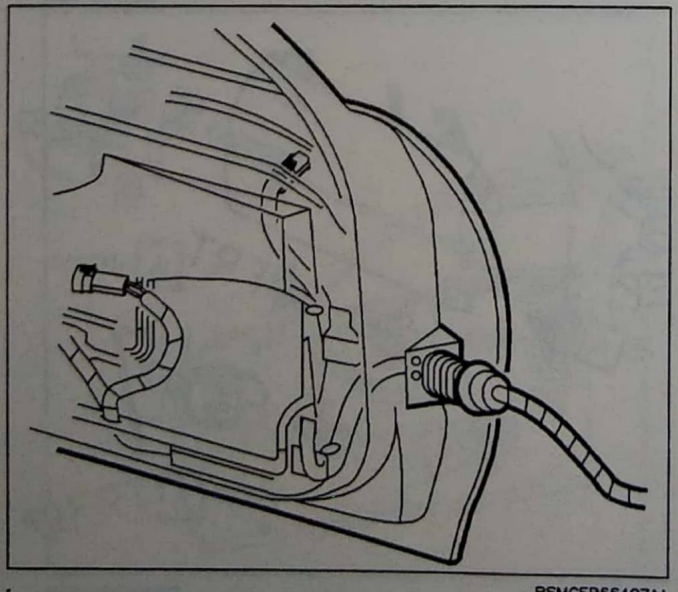

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INSTALLATION

1. Install hinge assembly to positioned mark.
2. Install nuts to hinge pillar studs. Torque as specified.

Torque: 24 N*m (18 ft—lbs)

3. Install bolts to door assembly. Torque as specified.

Torque: 30 Nᵉm (22 ft—lbs)

4. Check door alignment and proper operation of hinges.

DOOR ASSEMBLY

REMOVAL

1. Remove interior trim panel. (Refer to “Interior Trim Panel” procedure in this manual.)
2. Remove water deflectors from interior side of door assembly.
3. Remove outside rearview mirror assembly. (Refer to “Outside Rearview Mirror Assembly” procedure in this manual.)
4. Disconnect electrical connectors from all components in door assembly.

CAUTION: THIS VEHICLE HAS ENERGY-ABSORBING FOAM BLOCKS FOR SIDE IMPACT PROTECTION. TO HELP AVOID PERSONAL INJURY IN A COLLISION, FOAM BLOCKS MUST BE RE-INSTALLED IF NOT DAMAGED. FOAM BLOCKS THAT ARE DAMAGED FROM A COLLISION OR DURING REPAIRS MUST BE REPLACED. FAILURE TO RE-INSTALL OR REPLACE FOAM BLOCKS THAT ARE REMOVED CAN VIOLATE FEDERAL LAW.

5. Carefully remove energy absorbing foam from front door structure.
6. Remove grommet and side door wiring harness assembly from door assembly.
7. Support door assembly in full open position.
8. Mark outside position of hinge on door assembly and hinge pillar with a soft marker for installation.

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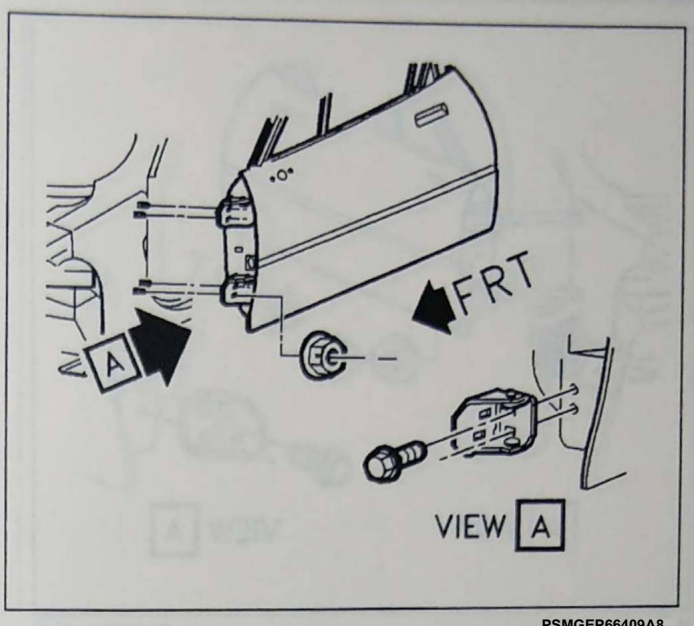
h Its from upper and lower hinges at door
! ^ntlocafons.

.cTALLATION

N", rinor assembly in full open position.

1. Supp°rt a



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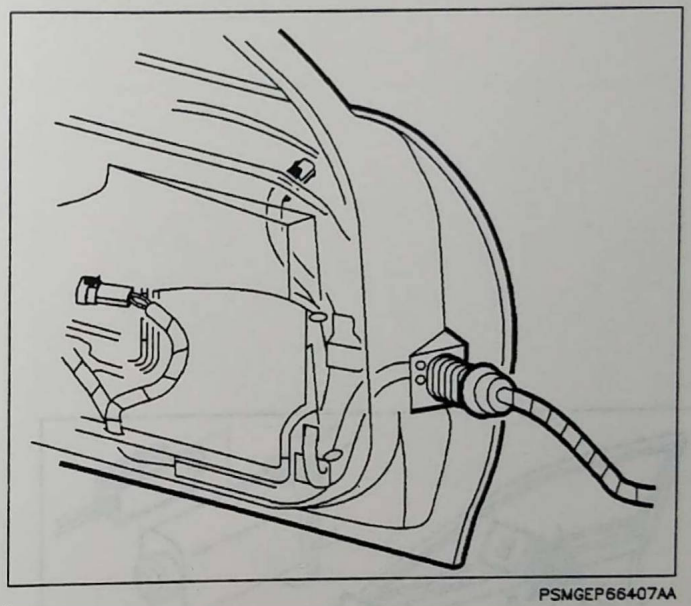
2. Install grommet and side door wiring harness to door assembly.



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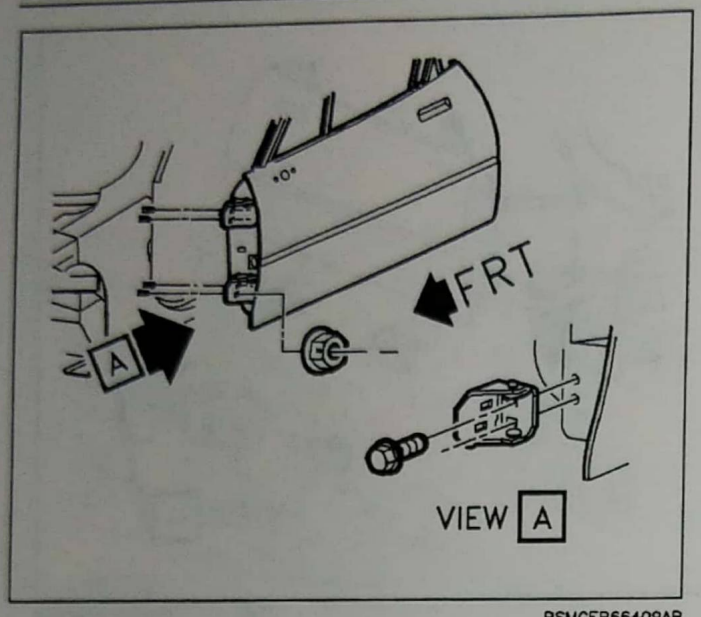

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IMPORTANT: Refer to "Clearance and Flushness Specifications" in the "General Information" section of this manual for panel alignment specifications.

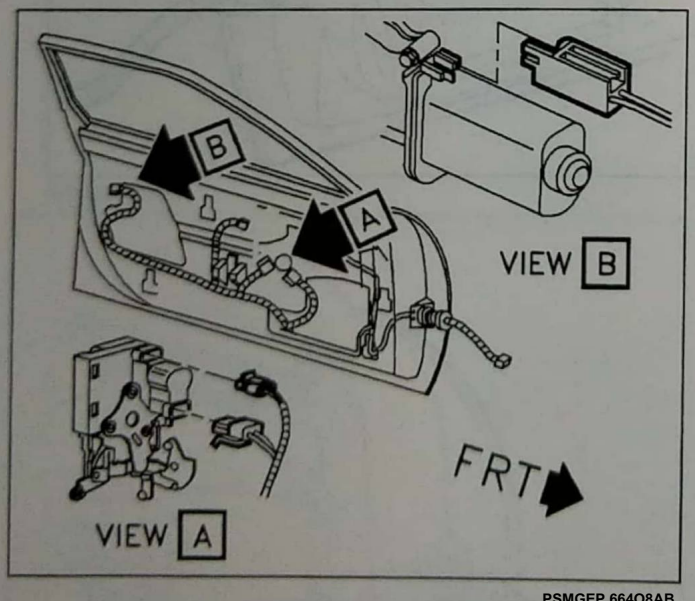
3. Align upper and lower hinges to positioning marks on door assembly.
4. Install bolts to upper and lower hinges at door assembly. Torque as specified.

Torque: 30 N*m (22 ft—lbs)

CAUTION: THIS VEHICLE HAS ENERGY-ABSORBING FOAM BLOCKS FOR SIDE IMPACT PROTECTION. TO HELP AVOID PERSONAL INJURY IN A COLLISION, FOAM BLOCKS MUST BE RE-INSTALLED IF NOT DAMAGED. FOAM BLOCKS THAT ARE DAMAGED FROM A COLLISION OR DURING REPAIRS MUST BE REPLACED. FAILURE TO RE-INSTALL OR REPLACE FOAM BLOCKS THAT ARE REMOVED CAN VIOLATE FEDERAL LAW

5. If energy absorbing foam was not damaged during removal; install 3m® SCOTCH-MOUNT Super Automotive Attachment Tape, P/N 06380 (or equivalent two-sided tape) to energy absorbing foam and install to door structure. Make sure both ends of the energy absorbing foam are tucked into mounting locations.

   If energy absorbing foam was damaged during removal or damaged from a collision, install new energy absorbing foam to door structure. Make sure both ends of the energy absorbing foam are tucked into mounting locations.



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6. Connect electrical connectors to components in door assembly. Test operation of all electrical components.
7. Install outside rearview mirror assembly.
8. Check door alignment and operation.
9. Install water deflectors to inside of door assembly.
10. Install interior trim panel to door assembly. (Refer to "Interior Trim Panel" procedure in this manual.)

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POOR *ADJUSTMENT*

i. Remove door lock striker when aligning doors. (Refer to "Door Striker" procedure in this manual.) [1]

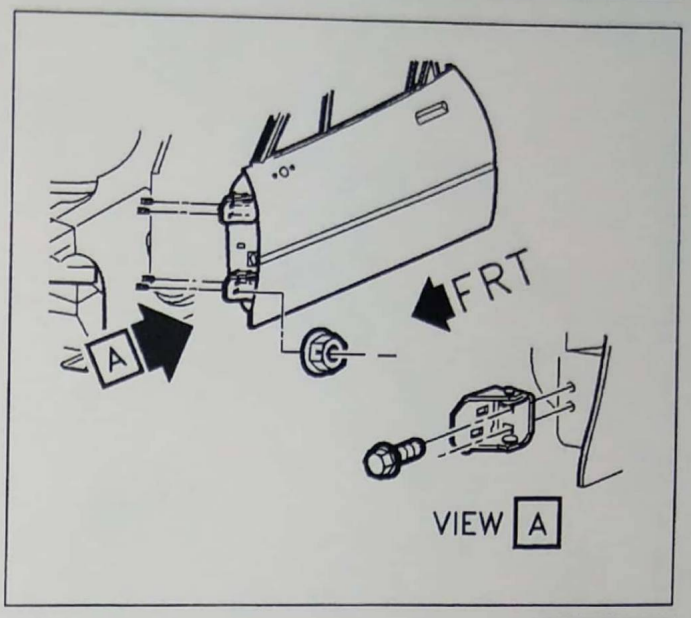
2. Adjust door up or down by loosening four hinge to door bolts and positioning the door as needed

NOTICE: Refer to "Clearance and Flushness Specifications" in the "General Information" section of ihis manual for panel alignment specifications.

3. Adjust door in or out by loosening hinge to door bolts, one hinge at a time, and positioning door in or out as needed.
4. Adjust door fore/aft (back) by loosening four hinge to body attachment nuts, one hinge at a time and positioning door as needed.
5. Tighten bolts after positioning door.

Torque: 30 N»m (22 ft—lbs)

6. Replace door lock striker. (Refer to "Door Striker" procedure in this manual.)



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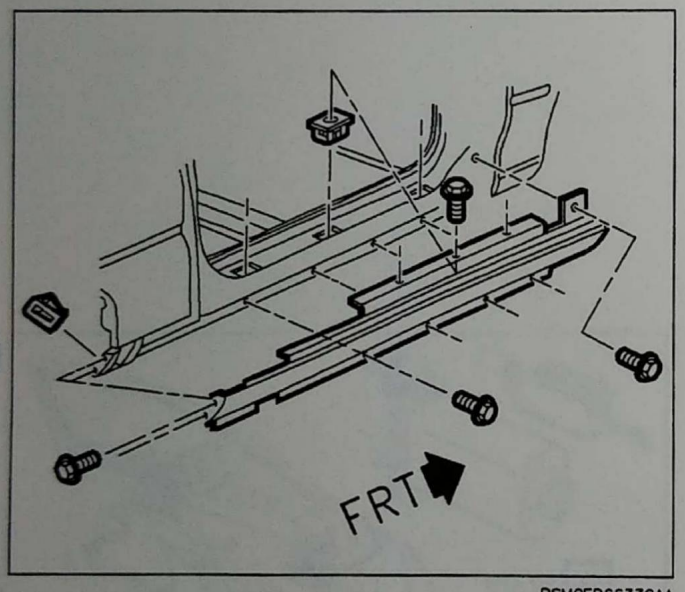
ROCKER PANELS, **APPLIQUES, AND RELATED COMPONENTS**

ROCKER OUTER FINISH PANEL

REMOVAL

1. Remove bolts retaining rocker outer finish panel to lower rocker panel flange and underbody center air deflector.
2. Remove bolts retaining rocker outer finish panel to rear quarter outer panel.
3. Remove bolts retaining rocker outer finish panel to body side panel.
4. Remove bolt retaining rocker panel front tab to lower hinge pillar.



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INSTALLATION

1. Install bolts retaining rocker outer finish panel to body side panel. Torque as specified.

Torque: 2 N*m (18 in—lbs)

2. Install bolt retaining rocker outer finish panel front tab to lower hinge pillar. Torque as specified.

Torque: 6 N*m (53 in —lbs)

3. Install bolts retaining rocker outer finish panel to rear quarter outer panel. Torque as specified.

Torque: 6 N*m (53 in-lbs)

4. Install bolts retaining rocker outer finish panel to lower rocker panel flange and underbody center air deflector. Check alignment of rocker outer finish panel to door lower edge. Torque as specified.

Torque: 6 N-m (53 in-lbs)

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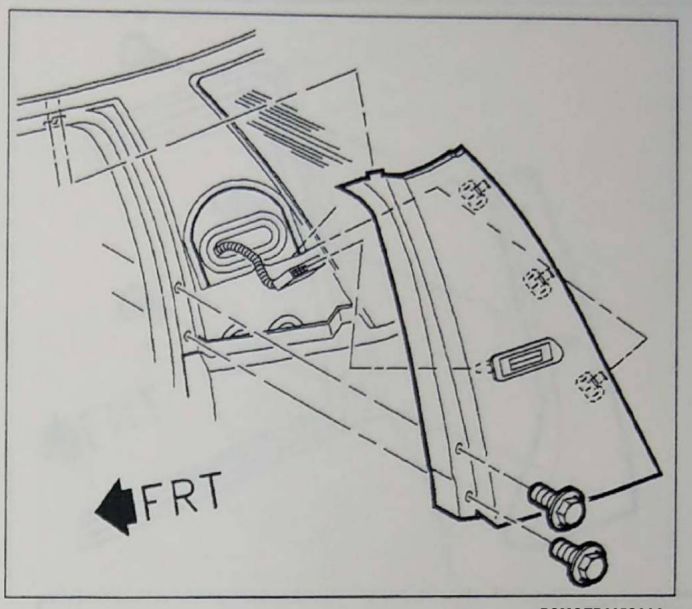
QUARTER PANEL OUTER UPPER (SAIL PANEL)



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REMOVAL

I Remove screws to body at front edge of panel

n Push panel tab at forward edge of panel rearward
* along roof side rail and then downward.

3 Slide retaining clips at rear edge of panel from under rear window glass.

4. Unwrap foam connection on back side of panel. Disconnect key pad connector to body harness connector.

INSTALLATION

1. Connect key pad connector to body harness connector. Foam wrap connection.
2. Slide retaining clips at rear edge of panel under rear window glass.
3. Insert panel tab at forward edge of panel upward into roof side rail.
4. Install screws to body at front edge of panel. Torque as specified.

Torque: 2 N*m (18 in-lbs)

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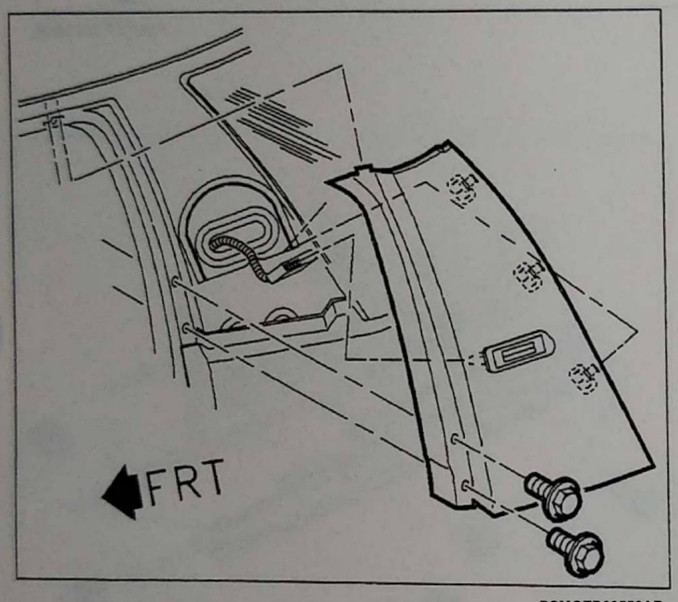
QUARTER PANEL OUTER UPPER WATER DEFLECTOR

Whenever work is performed where the water deflector is 1 disturbed, the deflector must be properly released to the body structure to prevent water leaks. For servicing seal, butyl adhesive is recommended if additional sealing material is required.

When access to the keypad electrical connection is required to perform service operations, the deflector may be completely or partially detached from the body structure. If the existing deflector is damaged so that it will not seal the body structure, replace the deflector.

If only a partial access opening in the reflector is required, perform only the steps that are necessary to expose the required area of the body structure.



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REMOVAL

1. Remove quarter panel outer upper. (Refer to "Quarter Panel Outer Upper" procedure in this manual.)
2. Break the sealer bond between the body structure and the water deflector with a flat—bladed tool.
3. Peel water deflector away from body structure.
4. Inspect deflector for tears or holes. Repair using waterproof body tape on both sides of deflector or replace with new part.

INSTALLATION

1. Remove any loose or defective sealer from water deflector.
2. Apply butyl adhesive to edges of water deflector.
3. Position water deflector equal distance around opening in body structure and over keypad wiring harness.

NOTICE: The quarter panel outer upper water deflector prevents water intrusion into the body structure. If water enters the body structure through this opening, it may drain down to the seat belt retractor.

4. Press firmly on butyl adhesive to secure water deflector to body structure. Check entire perimeter of water deflector to ensure proper seal.

5 • Install quarter outer upper. (Refer to " Quarter Panel Outer Upper "procedure in this manual.)

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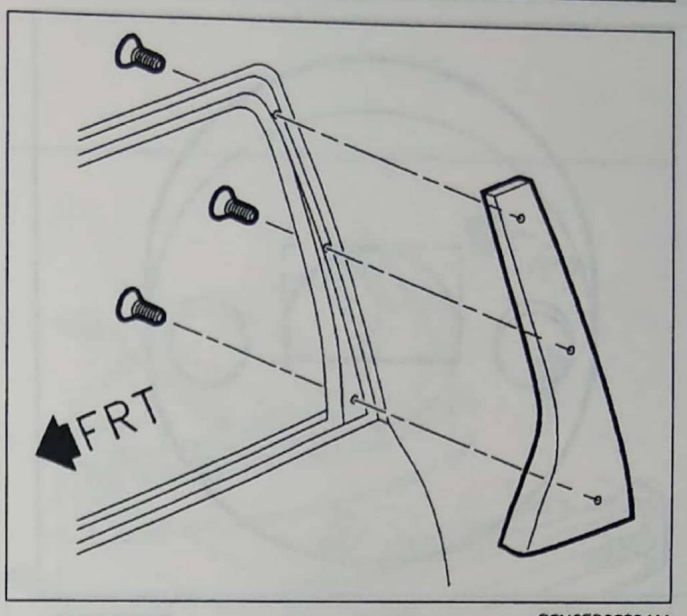
DQOR APPLIQUE

REMOVAL

1. Remove retaining screws from interior side of door assembly.
2. Lift off applique from door and weatherstrip.



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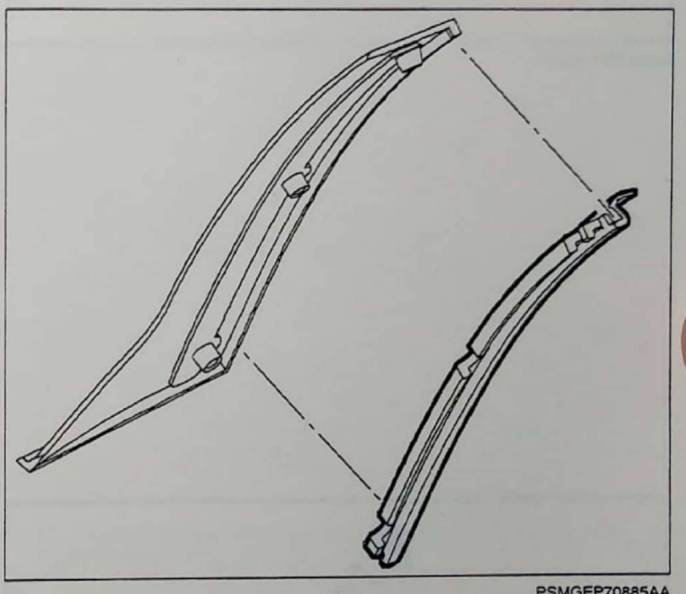
3. Remove door applique seal from door applique.

INSTALLATION

1. Install door applique into seal.



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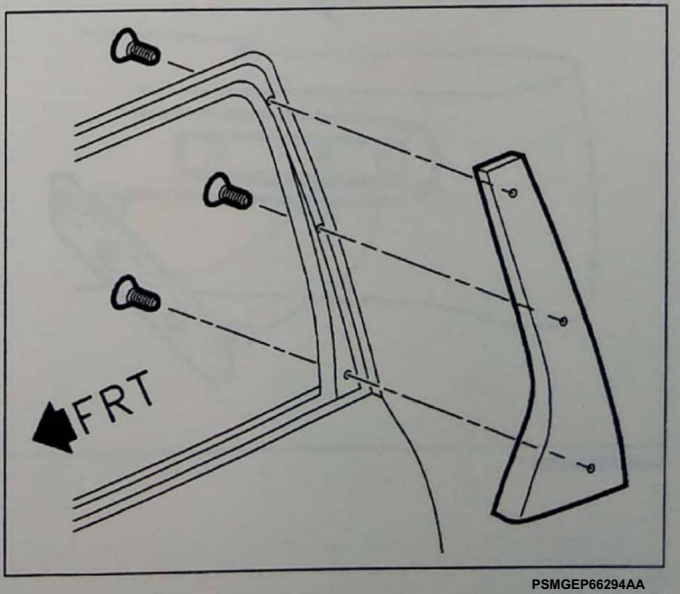
2. Install upper corner of applique into weatherstrip.
3. Secure applique to door with retaining screws. Torque as specified.

Torque: 3 N«m (26 in-lbs)



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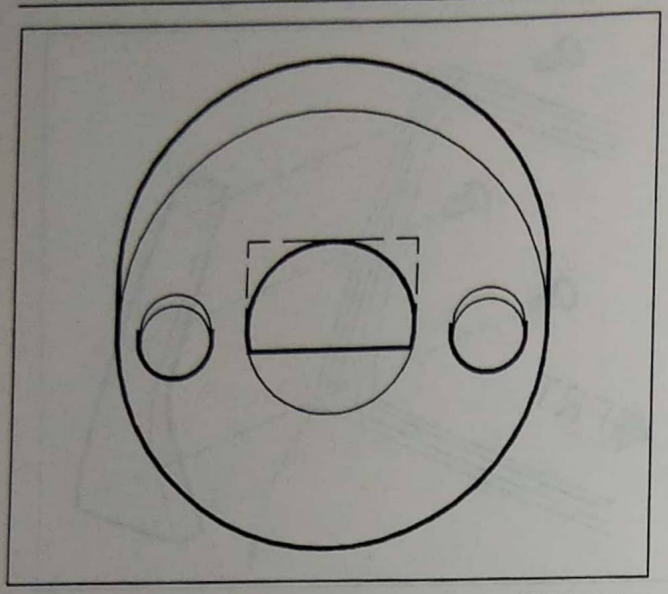

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SPECIAL TOOLS

- EV9702B—Window Retaining Nut Removal Tool

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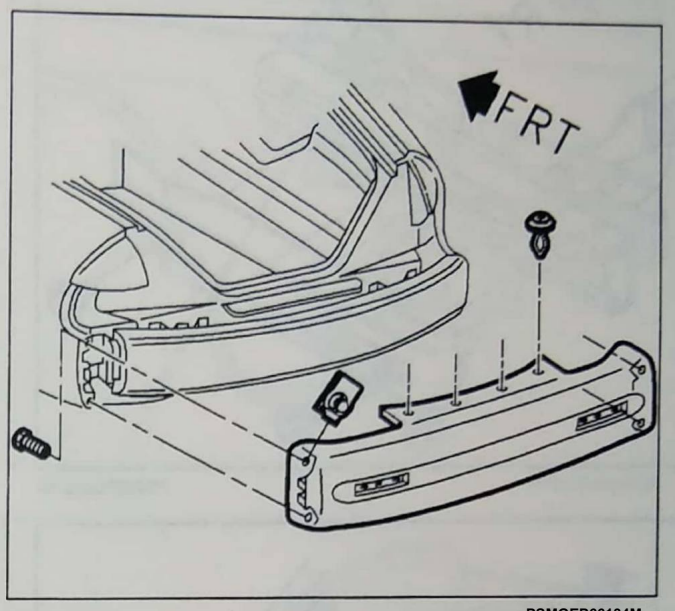
REAR END BODY COMPONENTS

REAR BUMPER FASCIA ASSEMBLY



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REMOVAL

1 Raise vehicle on hoist. (Refer to "Lifting, Jacking, and Support Points'' section in this manual.)

2. Remove rear underbody air deflector. (Refer to "Rear Underbody Air Deflector" procedure in this manual.)

3. Remove rear bumper fascia to body bolts at both quarter outer panel mounting location.

-s 4. Remove rear fascia to body push-in retainers.

5. Remove rear bumper fascia assembly from impact bar.

INSTALLATION

1. Install rear bumper fascia assembly to impact bar with two push in retainers.

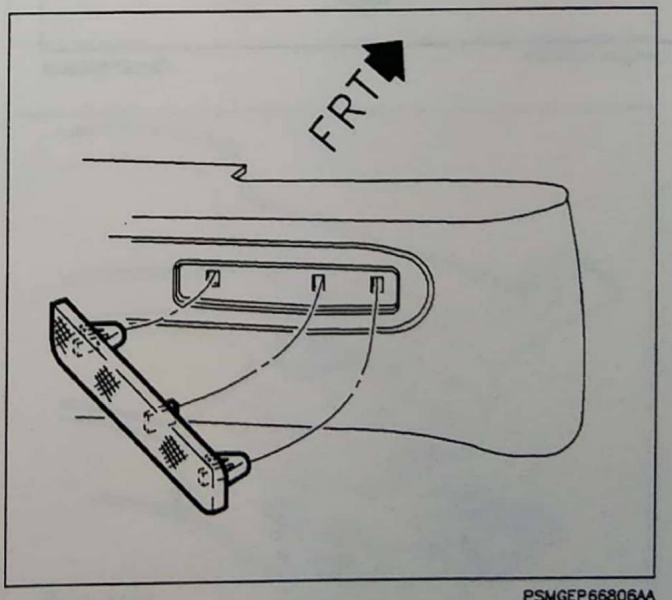
NOTICE: Refer to "Clearance and Flushness Specifications" in the "General Information" section of this manual for panel alignment specifications.

2. Through rear wheelhouse opening, install rear outer quarter panel to rear bumper fascia retaining bolts. Torque as specified.

Torque: 6 N«m (53 in—lbs.)

3. Install rear underbody air deflector. (Refer to "Rear Underbody Air Deflector" procedure in this manual.)

REAR BUMPER REFLECTOR



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REMOVAL

T Remove rear bumper fascia assembly. (Refer to "Rear Bumper Fascia Assembly" procedure in this manual.)

2- Compress reflector retaining tabs on backside of rear bumper fascia.

3 Push-out reflector from rear bumper fascia.

■NSTALLATION

1 Align reflector to opening in rear bumper fascia assembly. Reflector guide pin must align with center hole in rear bumper fascia assembly.

2. Push reflector retaining tabs through rear bumper fascia assembly.

3- Install rear bumper fascia assembly. (Refer to "Rear Bumper Fascia Assembly" procedure in this manual.)

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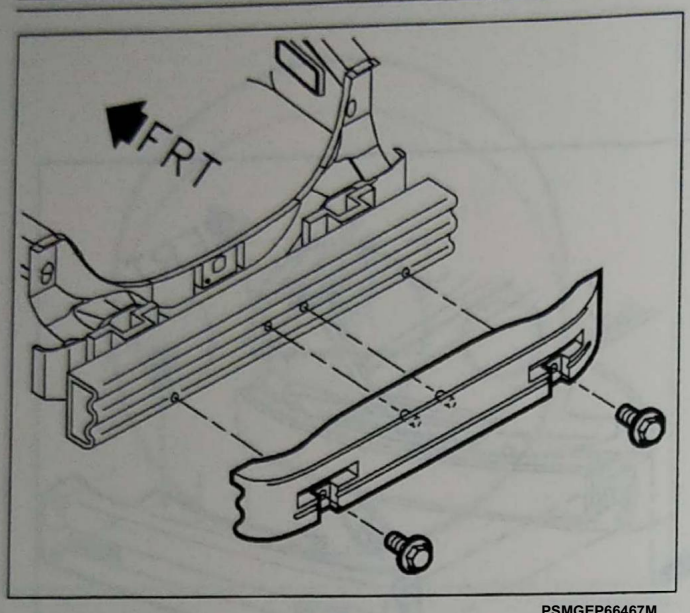

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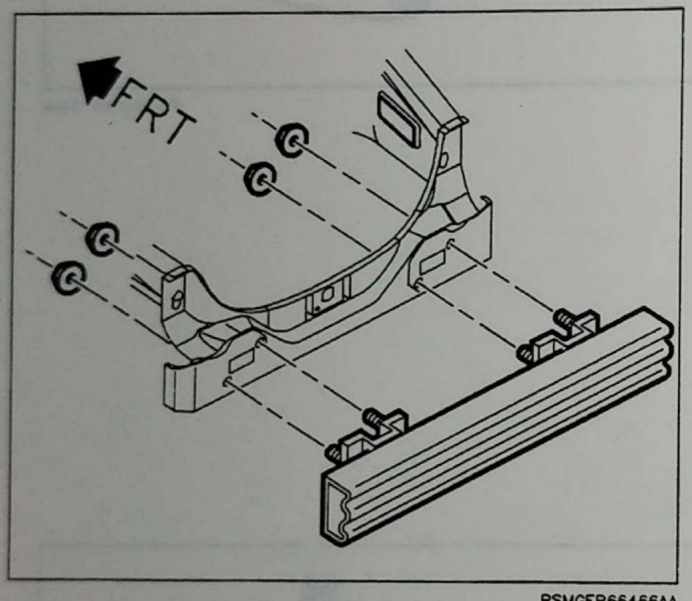
REAR BUMPER FASCIA ABSORBER

REMOVAL

1. Remove rear bumper fascia assembly. (Refer to "Rear Bumper Fascia Assembly" procedure in this manual.)
2. Remove absorber to impact bar retainers.
3. Remove energy absorber from impact bar.

INSTALLATION

1. Align energy absorber to impact bar.
2. Install absorber to impact bar with retainers.
3. Install rear bumper fascia assembly. (Refer to "Rear Bumper Fascia Assembly" procedure in this manual.)



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REAR BUMPER IMPACT BAR ASSEMBLY

REMOVAL

1. Remove rear bumper fascia assembly. (Refer to "Rear Bumper Fascia Assembly" procedure in this manual.)
2. Remove energy absorber. (Refer to "Energy Absorber" procedure in this manual.)
3. Remove upper and lower impact bar to frame retaining nuts. (Upper bolts can be accessed through rear compartment, under carpeting).
4. Remove impact bar from vehicle.

INSTALLATION

1. Install impact bar to vehicle body.
2. Secure impact bar to vehicle body with upper and lower impact bar to frame retaining nuts. Torque as specified.

Torque: 25 N*m (19 ft-lbs)

3. Install rear bumper impact bar assembly.
4. Install rear bumper fascia assembly. (Refer to "Rear Bumper Fascia Assembly" procedure in this manual.)

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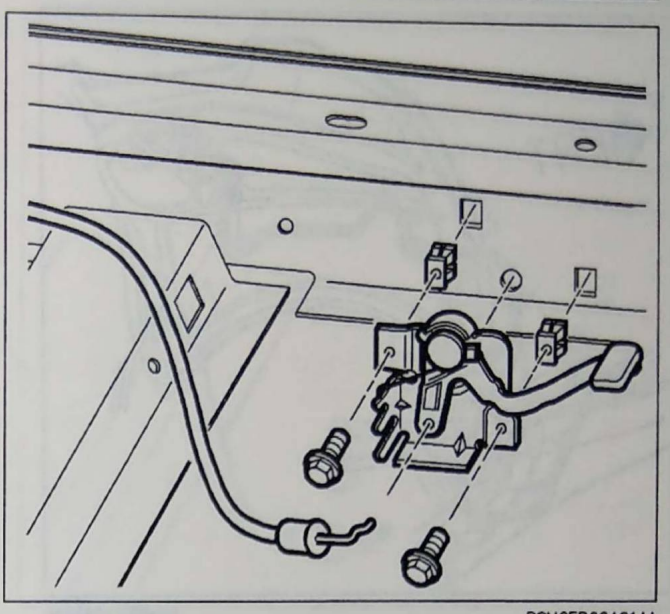
□FAR COMPARTMENT LID LOCK PLEASE CABLE ASSEMBLY

REMOVAL

1. Remove front side door opening floor carpet retaining assembly. (Refer to "Front Side Door Opening Floor Carpet Retaining Assembly" procedure in this manual.)
2. Remove bolts retaining compartment lid release cable bracket assembly to vehicle body.
3. Pry release cable grommet from bracket assembly.
4. Tape a 2.4 m (8 ft.) length of wire to latch end of cable.
5. Remove interior upper quarter panel assembly. (Refer to "Upper Quarter Panel Assembly" procedure in this manual.)
6. Remove cable retaining clips from vehicle body, compartment lid hinge, and compartment lid assembly. Note routing of compartment release cable for installation.



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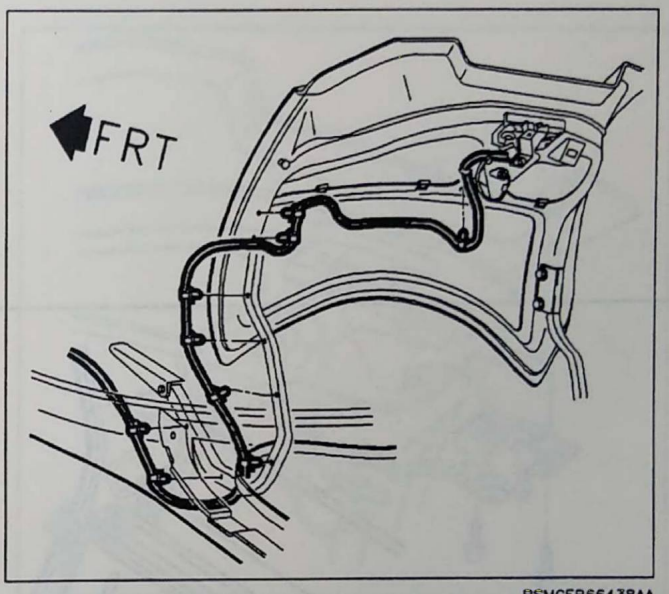

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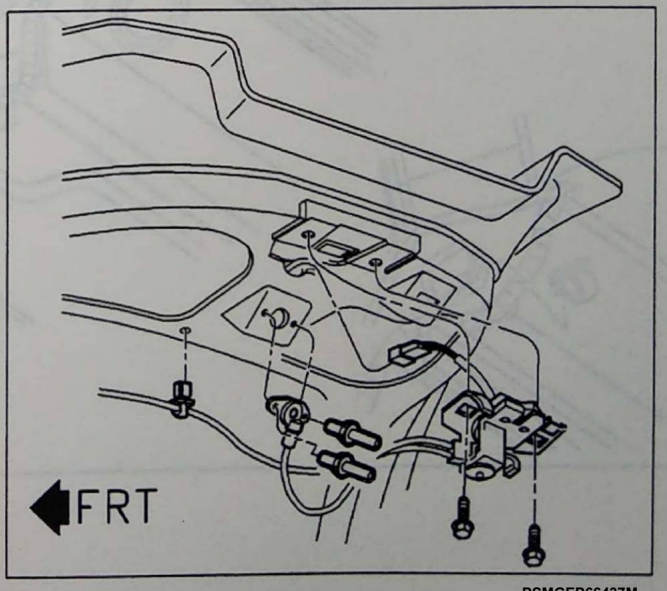
7. Remove bolts retaining lock assembly to compartment lid.
8. Drill out rivets retaining lock cylinder cable release to rear compartment lid.
9. Disconnect lock connector to wiring harness.



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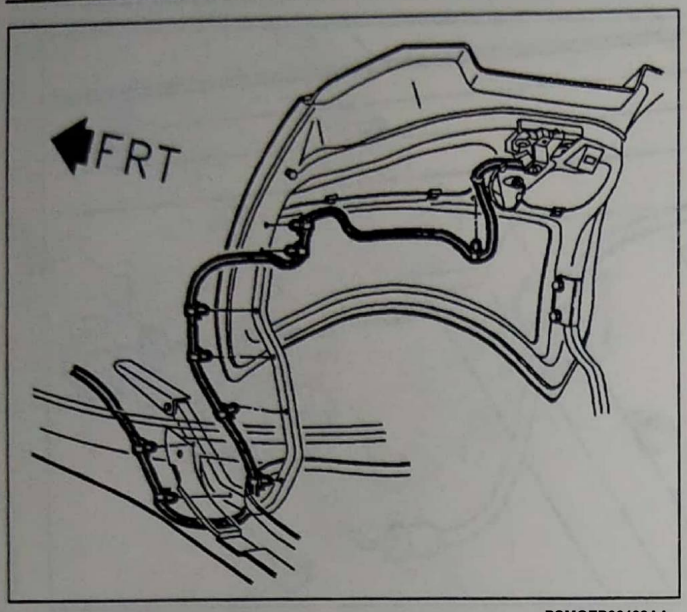

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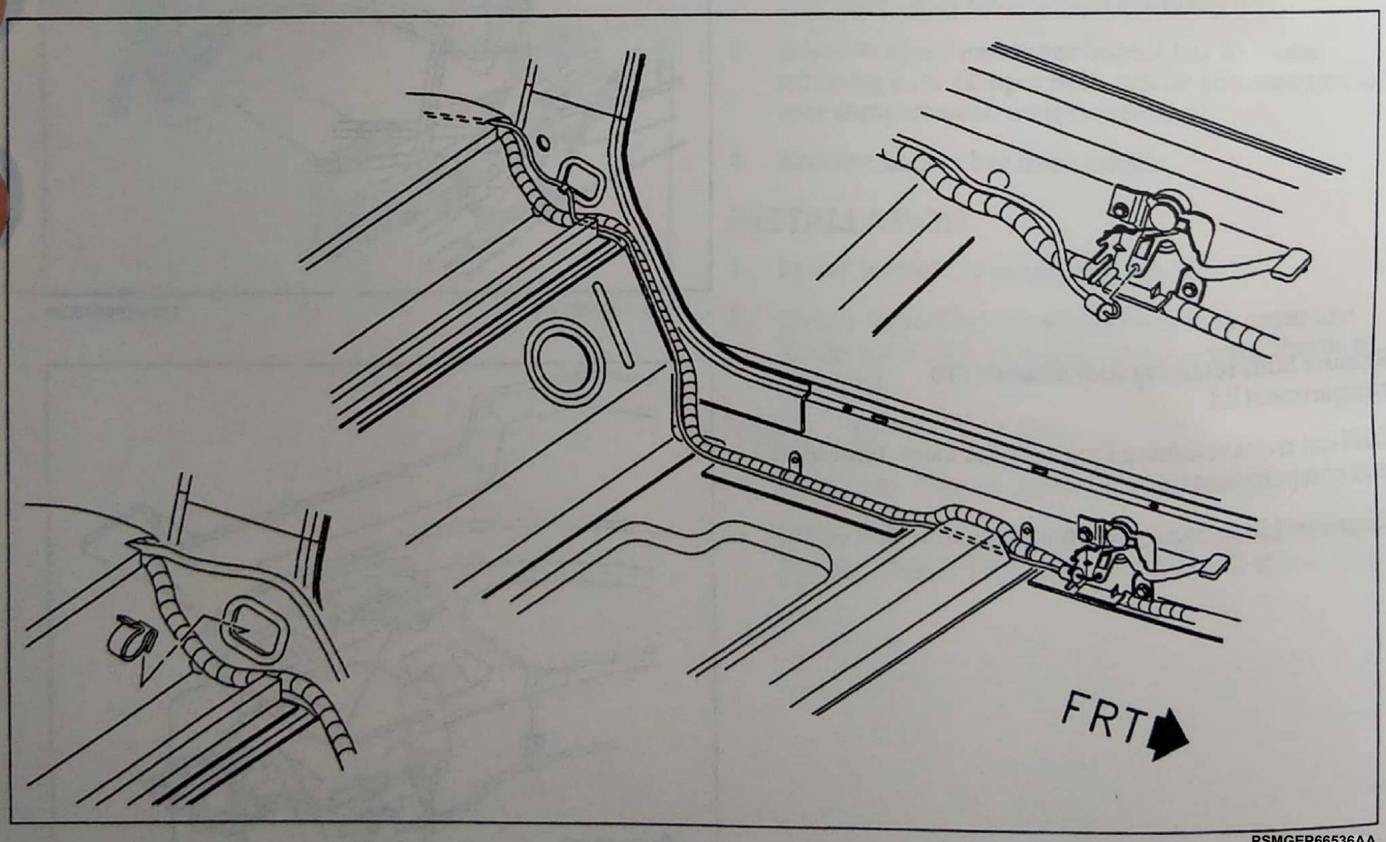
10. Pull cable assembly through vehicle interior into rear compartment area. Disassemble 2.4 m (8 ft.) length of wire and remove cable/latch assembly from vehicle

INSTALLATION

1. Tape feeder wire onto end of cable.
2. Pull cable through rear compartment into interior of vehicle using feeder wire. Route latch release cable where previously noted.
3. Remove feeder wire from cable.



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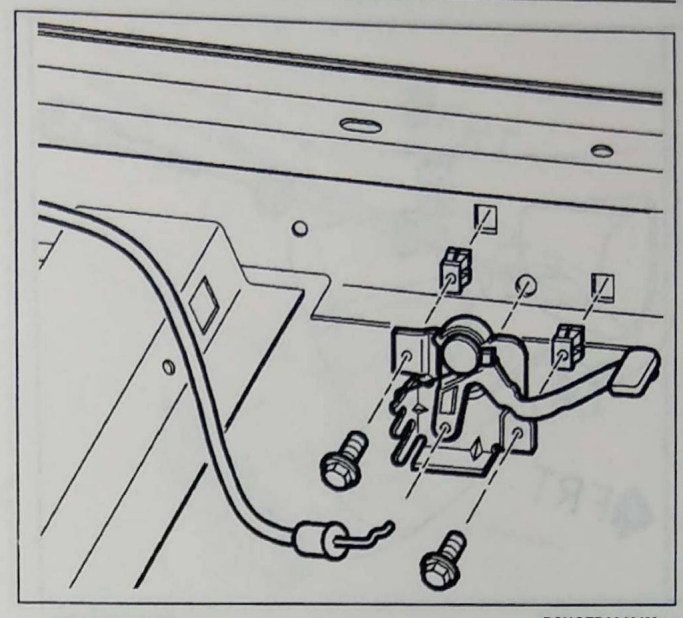
4. Attach latch release cable to release handle assembly.
3. install bolts retaining latch release assembly to vehicle body. Torque as specified.

Torque: 1.5 N«m (13 in-lbs)

6. Test operation of lock release cable before proceeding further.
7. Install front side door opening floor carpet retaining assembly. (Refer to “Front Side Door Opening Floor Carpet Retaining Assembly” procedure in this manual.)
8. Install interior upper quarter panel assembly. (Refer to “Upper Quarter Panel Assembly” procedure in this manual.)



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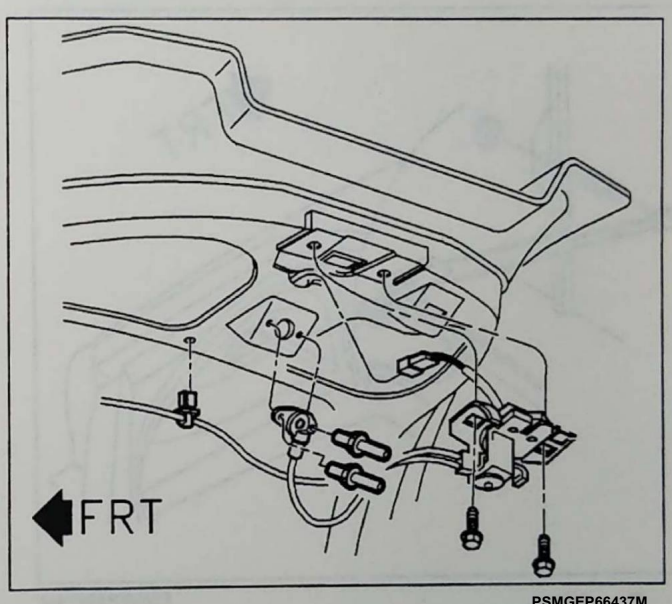
9. Connect lock connector to wiring harness.
10. Install rivets retaining cable release to compartment lid.
11. Install bolts retaining lock assembly to compartment lid.

Torque: 6 N*m (53 in-lbs)

12. Secure push retainers to rear compartment lid and hinge assembly.
13. Test operation of lock release cable before closing compartment lid.



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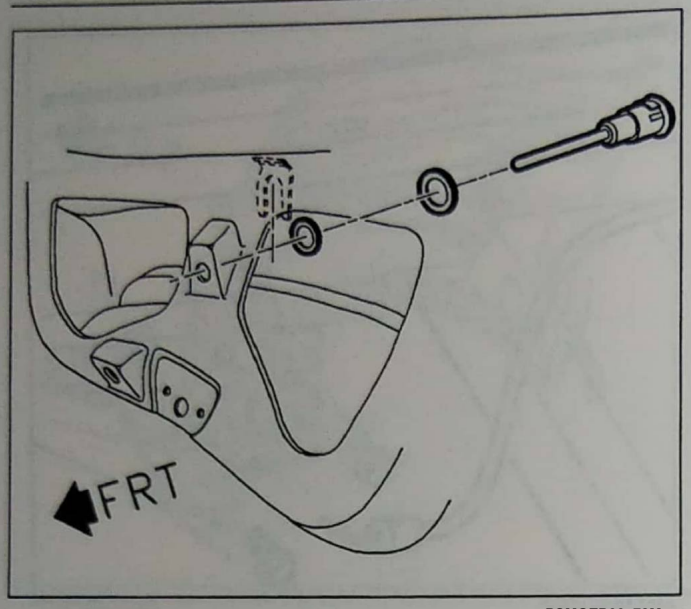

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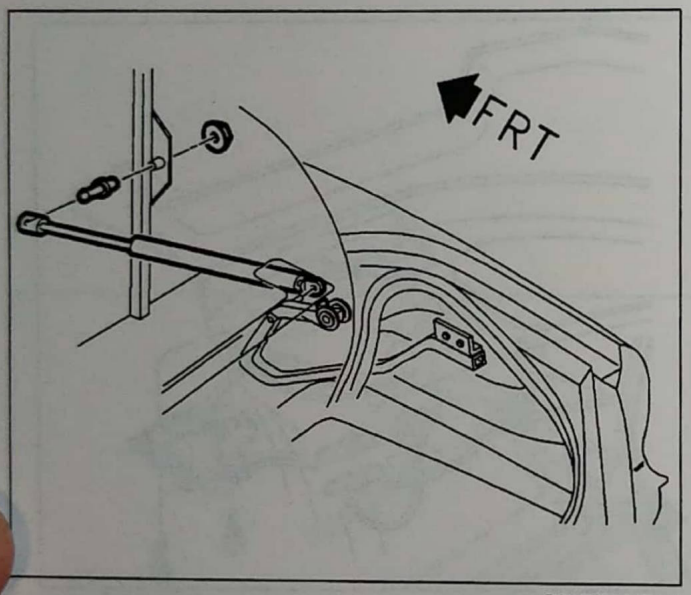

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REAR COMPARTMENT LOCK CYLINDER ASSEMBLY

REMOVAL

1. Open rear compartment lid assembly.
2. Remove lock cylinder retention clip from inside of rear compartment lid outer panel.
3. Remove lock cylinder from rear compartment lid.

INSTALLATION

1. Place lock cylinder into rear compartment lid outer panel.
2. Install lock cylinder retention clip.
3. Test lock cylinder operation before closing rear compartment lid.

REAR COMPARTMENT LID STRUT ASSEMBLY

REMOVAL

CAUTION: TO PREVENT PERSONAL INJURY COMPARTMENT LID MUST BE SUPPORTED WHEN REMOVING ONE OR BOTH STRUTS.

1. Open compartment lid, and support the compartment lid.
2. Using a small screwdriver, carefully pry spring clip back from end of strut.

NOTICE: Spring clip should not be removed from strut.

3. Remove strut end from strut anchor.
4. Repeat procedure for other end and remove strut.

INSTALLATION

1- Align strut end with strut anchor and push on to attach.

2. Remove compartment lid support and close compartment lid.
3. Check for proper operation of strut.

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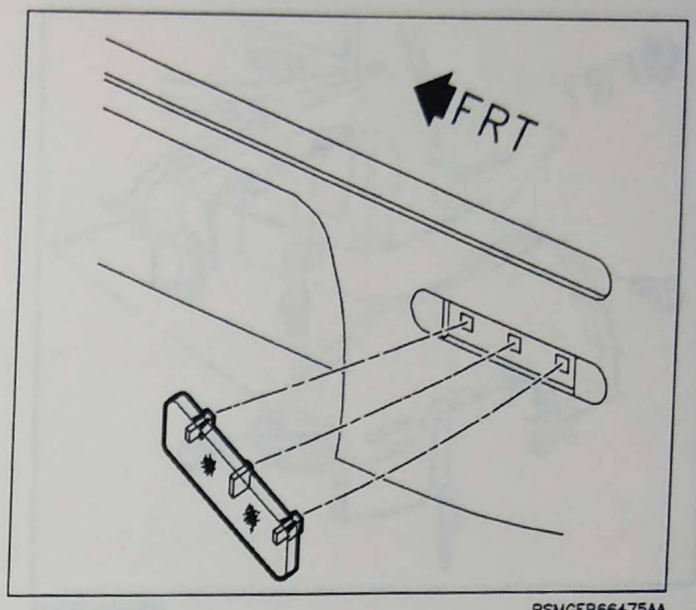
SIDE MARKER REFLECTOR ASSEMBLY

REMOVAL

1. Remove rear underbody air deflector. (Refer to "Underbody Rear Air Deflector" procedure in this manual)
2. Remove bolts retaining rear quarter outer panel to rear bumper fascia assembly.
3. Carefully pull quarter panel out and away from body to access and locate backside of side marker reflector assembly from rear quarter outer panel.
4. Compress retaining tabs to remove side marker reflector assembly from rear quarter outer panel.



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INSTALLATION

1. Align side marker reflector assembly to rear quarter outer panel mounting location.
2. Push side marker reflector assembly retaining tabs into opening.
3. Install quarter panel to rear bumper fascia assembly attaching bolts. Torque as specified.

Torque: 6N*m (53 in—lbs)

4. Install underbody rear deflector assembly. (Refer to "Underbody Rear Air Deflector" procedure in this manual.) Torque as specified.

Torque: 6 N*m (53 in-Ibs)

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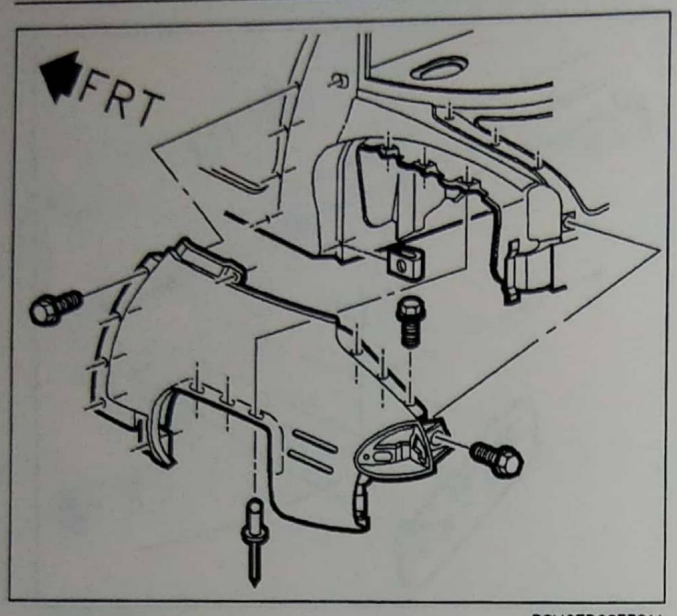

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REAR QUARTER OUTER PANEL

REMOVAL

1. Remove quarter outer upper panel (sail panel). (Refer to "Quarter Outer Upper Panel" procedure in this manual.)
2. Remove rear wheel opening cover. (Refer to "Rear Wheel Opening Cover Removal" procedure in this manual.)
3. Remove rivets from outer edge of rear wheelhouse liner.
4. Remove underbody rear air deflector. (Refer to "Underbody Rear Air Deflector" procedure in this manual.)
5. Remove bolts retaining rear quarter outer panel to rear bumper fascia assembly.
6. Remove rocker outer finish panel. (Refer to "Rocker Outer Finish Panel" procedure in this manual.)
7. Remove screws retaining tail lamp assembly to rear quarter outer panel. Pull tail lamp assembly straight out from opening in rear quarter outer panel.
8. Disconnect tail lamp bulb sockets from tail lamp assembly.
9. Remove bolts retaining rear quarter outer panel to vehicle structure.
10. Remove rear quarter outer panel from structure. If installing new rear quarter outer panel, remove side marker reflector assembly from old rear quarter outer panel.

INSTALLATION

1. Align and install side marker reflector assembly to rear quarter outer panel.
2. Position rear quarter outer panel to vehicle structure.

IMPORTANT: Lower rear window reveal molding must overlap top of rear quarter outer panel.

IMPORTANT: Refer to "Clearance and Flushness Specifications" in the "General Information" section of this manual for panel alignment specifications.

3. Loose install bolts retaining rear quarter outer panel to vehicle structure.
4. Align rear quarter outer panel to door assembly. Torque bolts as specified.

Torque: 6 N*m (53 in-lbs)

5. Align rear quarter outer panel to rear compartment lid. Torque bolts as specified.

Torque: 6 N*m (53 in - lbs)

6. Connect tail lamp bulb sockets to tail lamp assembly-
7. Push tail lamp assembly straight into opening in rear quarter outer panel. Install tail lamp retaining screws. Torque as specified.

Torque: 1.5 N«m (13 in-lbs)

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^7 tall quarter outer upper panel (sail panel) to
8. ins... vehicle structure with retaining screw. Torque as specified.

Torque 2 N«m (18 in-lbs)

IMPC... 1RTANT: Refer to "Clearance and Flushness specifi... cations" in the "General Information" section of Jis manual for panel alignment specifications.

o install rocker outer finish panel. Align rocker outer finish panel to door, front fender, and rear quarter outer panel. Torque retainers as specified.

- Bolts retaining rocker outer finish panel to hinge pillar, rear quarter outer panel, and rocker panel lower pinchwcld flange.

Torque: 2 N*m (18 in-lbs)

- Bolts retaining rocker outer finish panel to top of body side panel (inside of door opening).

Torque: 6 N-m (53 in —lbs)

10. Loose install bolts retaining rear bumper fascia assembly to rear quarter outer panel. Align rear bumper fascia assembly to rear quarter outer panel. Torque bolts as specified.

Torque: 6N*m (53 in—lbs)

11. Install rivets of outer edge of rear wheelhouse panel liner.

12. Install underbody rear air deflector. (Refer to "Underbody Rear Air Deflector" procedure in this manual.)

13. Install rear wheel opening cover into wheel opening.

    a. Insert tabs on rear wheel opening cover into retaining slots located on rear quarter outer panel.

    b. Turn attaching fasteners 1/4 turn to lock rear wheel opening cover in place.

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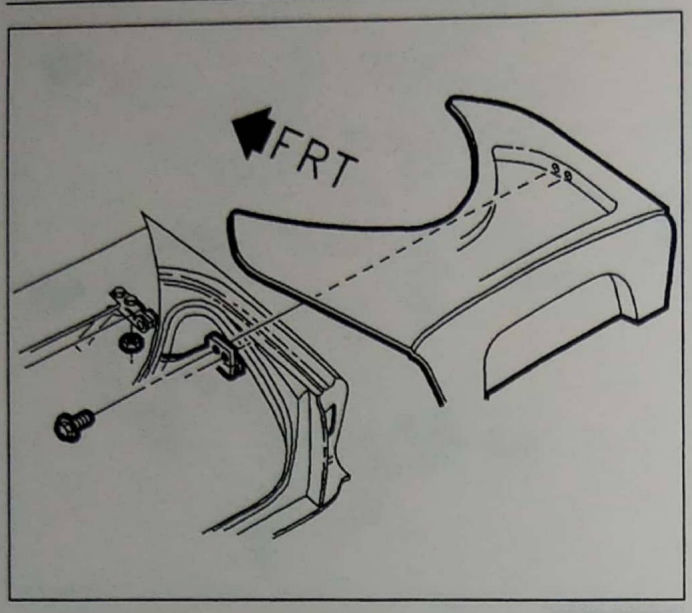

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REAR COMPARTMENT LID

REMOVAL

1. Disconnect tire monitor reset switch and license plate lamps from wiring harness.
2. Remove bolts retaining lock assembly to rear compartment lid.
3. Drill out rivets retaining lock cylinder cable release to rear compartment lid.
4. Remove wiring harness and power trunk release cable from retaining clips.
5. Mark position of compartment lid to hinge mounting location with a soft marker for installation.
6. Remove rear compartment lid to hinge attachment bolts.
7. With the aid of a helper, remove rear compartment lid.

INSTALLATION

1. With the aid of a helper, align rear compartment lid hinges to alignment marks.

IMPORTANT: Refer to "Clearance and Flushness Specifications" in the "General Information" section of this manual for panel alignment specifications.

2. Install rear compartment lid to hinge attachment bolts. Torque bolts as specified.

Torque: 10 N*m (89 in-lbs)

3. Check rear compartment lid alignment and align as necessary.
4. Route wiring harness and rear compartment remote control lock cable through harness routing connectors and lock connectors.
5. Connect license plate lamps and tire monitor reset button.
6. Recheck rear compartment alignment and align as necessary.

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REMOVAL

mON TO PREVENT PERSONAL INJURY AMP4RTMENT LID MUST BE SUPPORTED WHEN REMOMNC' ONE OR BOTH STRUTS.

j place a prop under rear compartment lid that will safely support it.

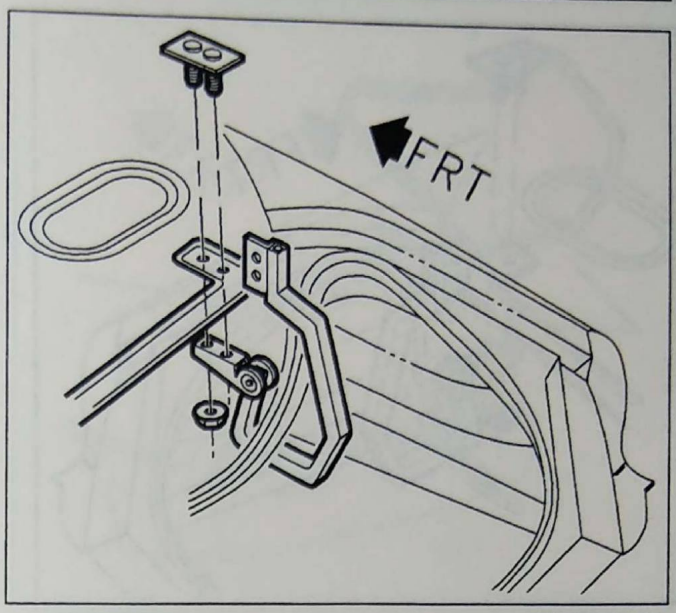
NOTICE: Protect painted surfaces around rear compartment lid from accidental scratches during rear compartment lid removal and installation.

2 Remove rear compartment lid struts. (Refer to "Compartment Lid Strut Assembly" procedure in this manual.)

3. Remove rear compartment lid hinge to rear compartment lid bolts.

4. Remove rear compartment lid hinge to body bolts.

5. Remove rear compartment lid hinge assembly.



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INSTALLATION

1. Install hinge assembly and fasten to body with retaining nuts. Torque as specified.

Rear Compartment Lid To Body

Torque: 10 N*m (89 in—lbs)

2. Install hinge arm to rear compartment lid.

Rear Compartment Lid To Hinge

Torque: 10 N*m (89 in-lbs)

3. Support rear compartment lid in full open position.

4. Install rear compartment lid strut.

5. Align rear compartment lid (Refer to "Compartment Lid Adjustment"* procedure in this manual.)

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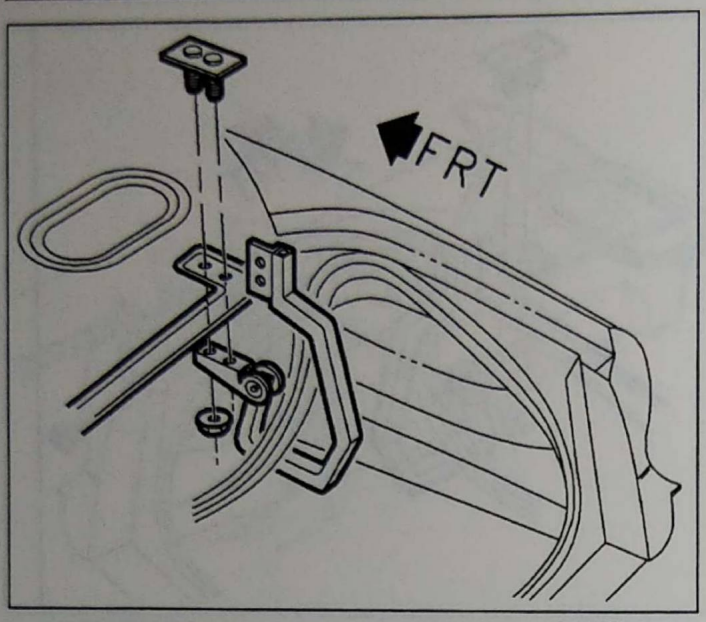

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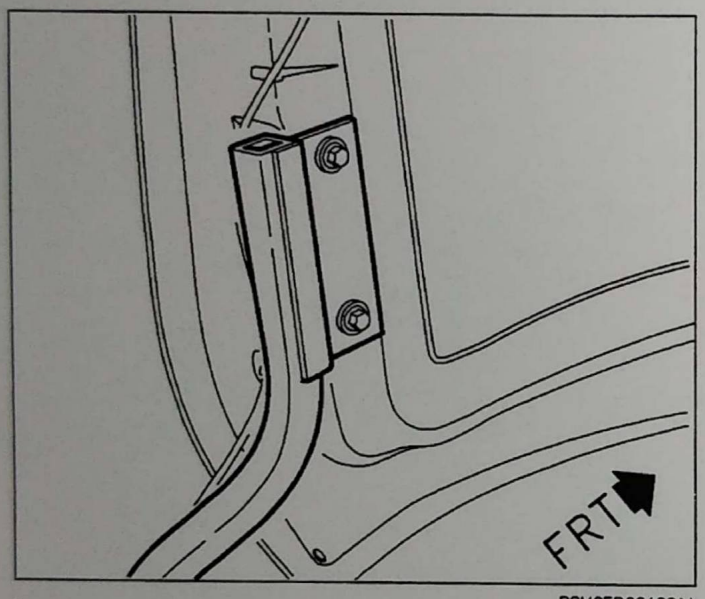
REAR COMPARTMENT LID ADJUSTMENT

ADJUSTMENT

1. Adjust rear compartment lid cross-car by loosening hinge to package shelf nuts and positioning as needed

NOTICE: Refer to "Clearance and Flushness Specifications" in the "General Information" section of this manual for panel alignment specifications.



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2. Adjust rear compartment lid fore and aft and up and down at front by loosening rear compartment lid to hinge arm bolts and positioning as needed.
3. Adjust up and down at rear by adjusting striker up and down. (Refer to "Compartment Lid Lock Striker" procedure in this manual.)
4. Tighten hinge to package shelf nuts.

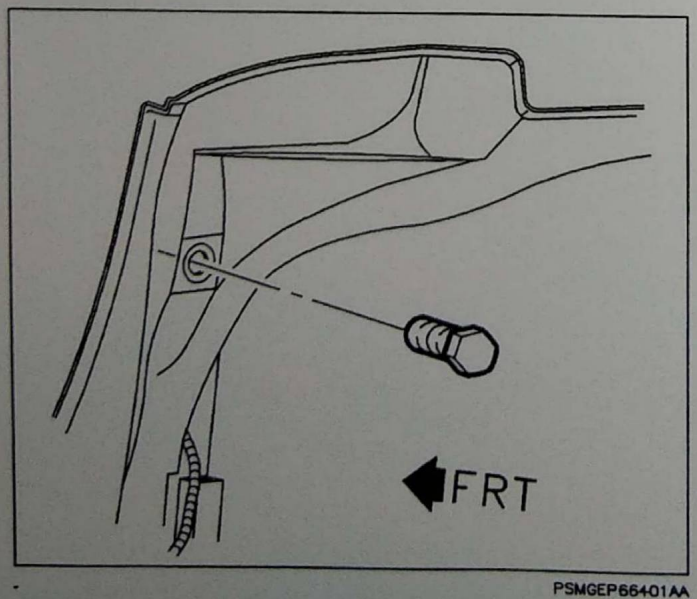
Torque: 10 N•m (89 in−lbs)

5. Tighten rear compartment lid-to-hinge arm bolts.

Torque: 10 N•m (89 in−lbs)

6. Tighten latch striker bolts when adjustments are complete.

Torque: 10 N•m (89 in−lbs)



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7. Change height at rear of compartment lid by turning bumper assemblies up or down or by adjusting latch assembly.

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oPAR COMPARTMENT WEATHERSTRIP

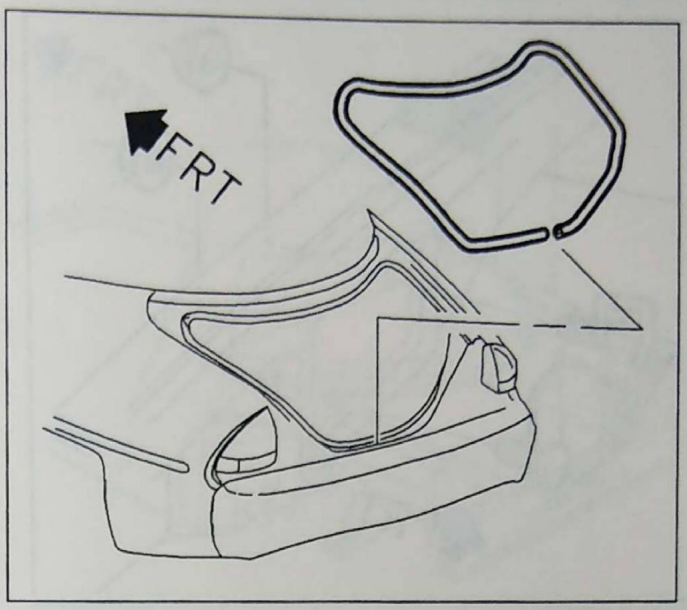
REMOVAL

Remove weatherstrip from rear compartment
[1] opening flange-

INSTALLATION

1 Install weatherstrip on rear compartment flange with sealing lip toward outside of opening. Ends of weatherstrip should meet at lower rear center of rear compartment opening.

2. Insure weatherstrip is fully engaged by using a plastic mallet to gently tap and seat weatherstrip onto flange.



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REAR COMPARTMENT LID EMBLEMS

REMOVAL

1. Hold heat gun at least 152 mm (6 in.) from emblem assembly.

2. Pull emblem assembly from rear compartment lid assembly with flat-bladed tool, making sure not to damage paint.

INSTALLATION

NEW EMBLEM ASSEMBLY

1- Clean area with suitable solution of isopropyl alcohol (50/50 mixture by volume with water) or high-flash naphtha.

2 Wipe area clean with clean dry cloth.

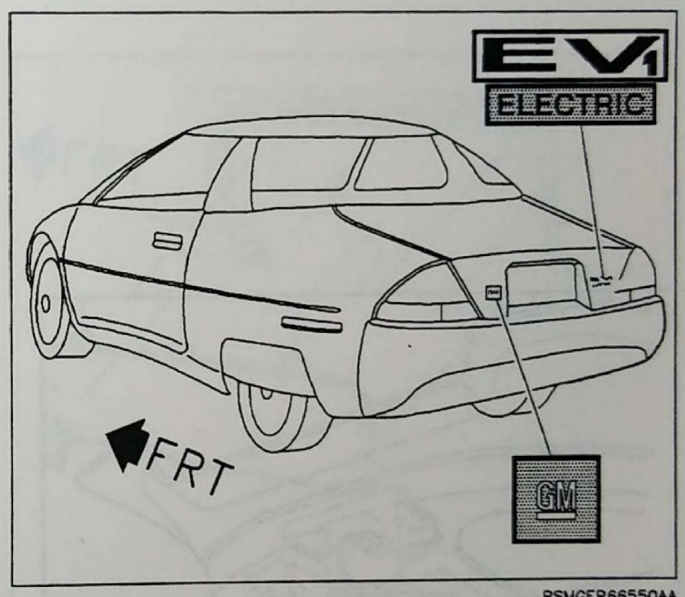
3. Heat fascia assembly surface and adhesive side of new emblem assembly. Temperature must be 26[0] C (80 F) [°] [or] 6'C (42°F) above air temperature in area, whichever is higher, but not exceeding 40°C (104°F).

4. Remove protective liner from adhesive strip.

IMPORTANT: Position emblem assembly carefully, [e]mblem assembly cannot be removed without reapplying [a]dhesive after contact with vehicle.

5. Hess emblem assembly into place and apply pressure.

6. Remove protective film front of emblem.



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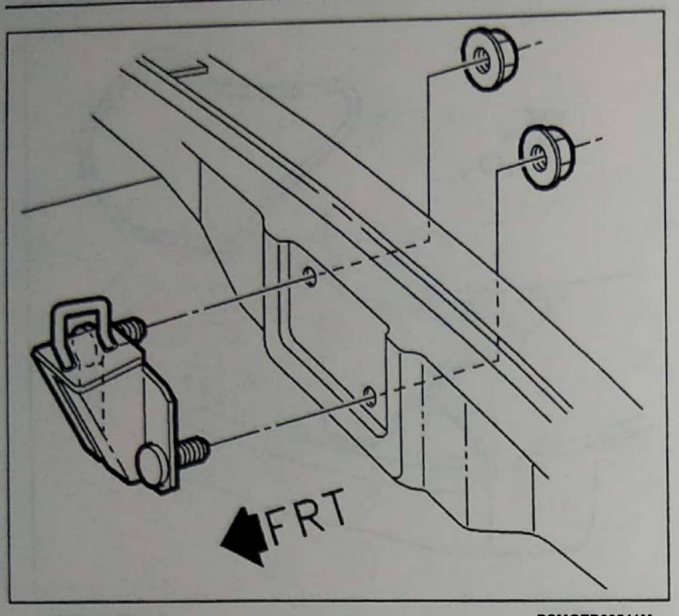

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REAR COMPARTMENT LID LOCK STRIKER

REMOVAL

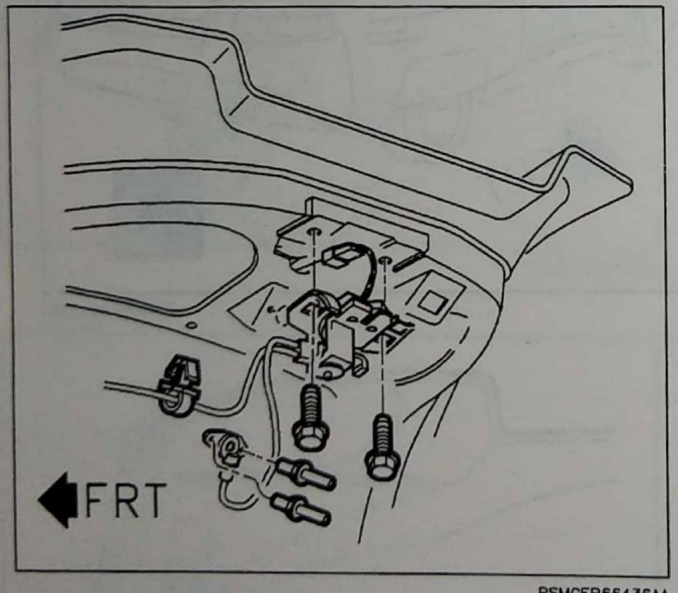
1. Open rear compartment lid assembly.
2. Mark position of compartment lid lock striker with soft marker for installation.
3. Remove underbody rear air deflector. (Refer to "Underbody Rear Air Deflector Removal" section of this manual.)
4. Remove lock striker to body end panel retaining nuts.
5. Remove striker assembly.

INSTALLATION

1. Install striker assembly to positioned mark on body with nuts. Torque as specified.
2. Install underbody rear air deflector. (Refer to "Underbody Rear Air Deflector Installation" section of this manual.)

Torque: 10 N*m (89 in—lbs)

3. Close rear compartment lid assembly and check for proper alignment.
4. Realign as necessary.



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REAR COMPARTMENT LID LOCK ASSEMBLY

REMOVAL

1. Open rear compartment lid assembly.
2. Mark position of compartment lid lock with soft marker for installation.
3. Remove lock and release cables from compartment lid lock assembly.
4. Remove lock to compartment lid retaining bolts.
5. Remove compartment lid lock assembly.

INSTALLATION

1. Install compartment lid lock assembly to positioned mark on body with bolts. Torque as specified.

Torque: 6 N«m (53 in-lbs)

2. Install lock and release cables to compartment lid lock assembly.
3. Test operation of compartment lid lock assembly before closing rear compartment lid.
4. Close rear compartment lid and check for correct alignment.
5. Realign as necessary.

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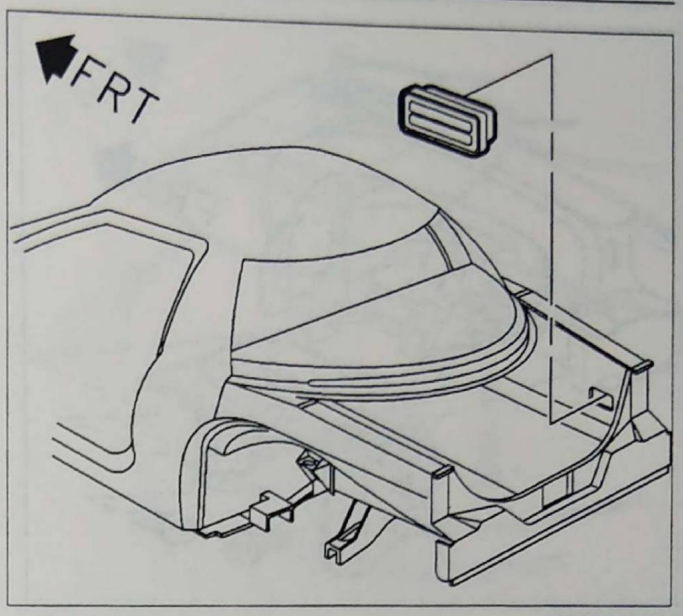
PRESSURE RELIEF VALVE



PSMVIS66130AA

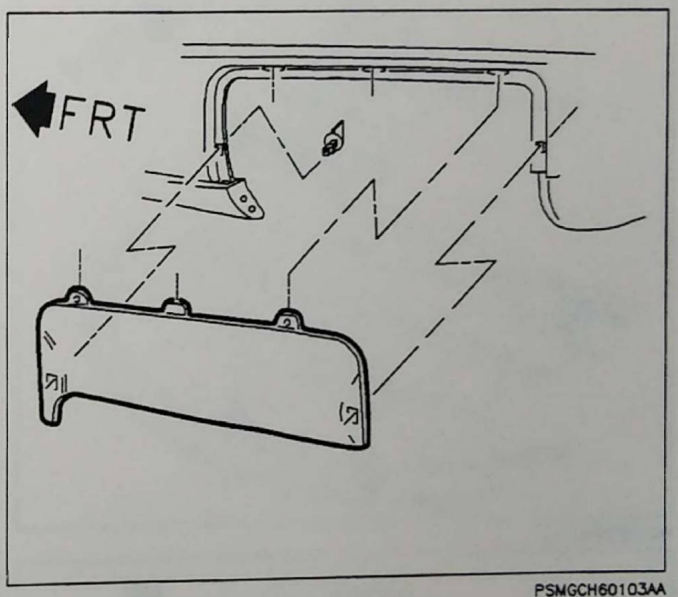
REMOVAL

1. Remove rear quarter outer panel. (Refer to "Rear Quarter Outer Panel" procedure in this manual.)
2. Grasp upper and lower attaching tabs (four total) to disengage pressure relief valve from body.
3. Push valve assembly into rear compartment of vehicle.
4. Open compartment lid and remove assembly from vehicle.

INSTALLATION

1. Align notch in vehicle structure to tab on pressure relief valve.
2. Snap pressure relief valve into body.
3. Install rear quarter outer panel. (Refer to "Rear Quarter Outer Panel" procedure in this manual.)

REAR WHEEL OPENING COVER



PSMGCH60103AA

REMOVAL

1. Turn locking retainers on inboard side of cover at front or rear edge of wheel opening cover 1/4 turn.
2. Pull out and lower rear wheel opening cover from quarter panel opening.

INSTALLATION

1- Install cover to quarter outer panel wheel opening. Insert three existing tabs into wheel opening on quarter panel.

2- Secure cover to quarter panel with two retainers. Turn retainer 1/4 turn to lock in place.

5. Check for retainer engagement to rear wheel opening cover to ensure retention.

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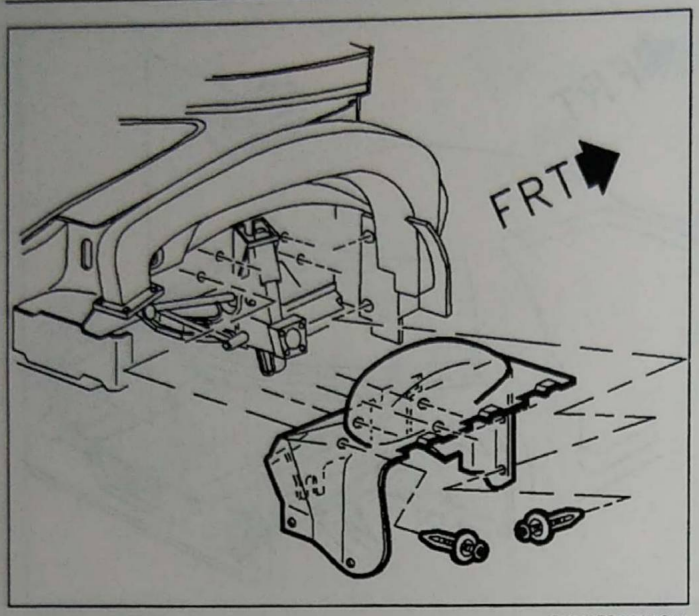

PSMGEP66042AA

REAR WHEELHOUSE PANEL LINER

REMOVAL

1. Raise vehicle on hoist. (Refer to "Lifting, Jacking, and Support Points'' section in this manual.)
2. Remove rear wheel opening cover. (Refer to "Rear Wheel Opening Cover" in this manual.)
3. Remove rear wheel and tire assembly.
4. Remove rivets at outer edge of rear wheelhouse panel liner and rear quarter outer panel.
5. Remove plastic retainers from lower rear inner rail.
6. Remove plastic retainers from rear wheelhouse liner at each side of the anti-lock braking system (ABS) wiring grommet.
7. Remove plastic retainers from rear wheelhouse liner to rear underbody air deflector.
8. Remove plastic retainer at rear wheelhouse liner to center underbody air deflector.
9. Remove rear wheelhouse liner from around rear axle assembly.

IMPORTANT: Note location where wheelhouse liner tucks in behind outer edge of fender for reassembly.

INSTALLATION

1. Install plastic retainers to lower rear inner rail.
2. Install plastic retainers at rear wheelhouse liner on each side of the anti-lock braking system (ABS) wiring grommet.
3. Install plastic retainers at rear wheelhouse panel liner to rear underbody air deflector.
4. Install plastic retainer at rear wheelhouse panel liner to center underbody air deflector.
5. Install rivets at outer edge of rear wheelhouse panel liner and rear quarter outer panel.
6. Install rear wheel and tire assembly. Torque lug nuts as specified.

Torque: 120 N*m (89 ft-lbs)

7. Lower vehicle.
8. Install rear wheel opening cover to rear outer quarter panel of vehicle.

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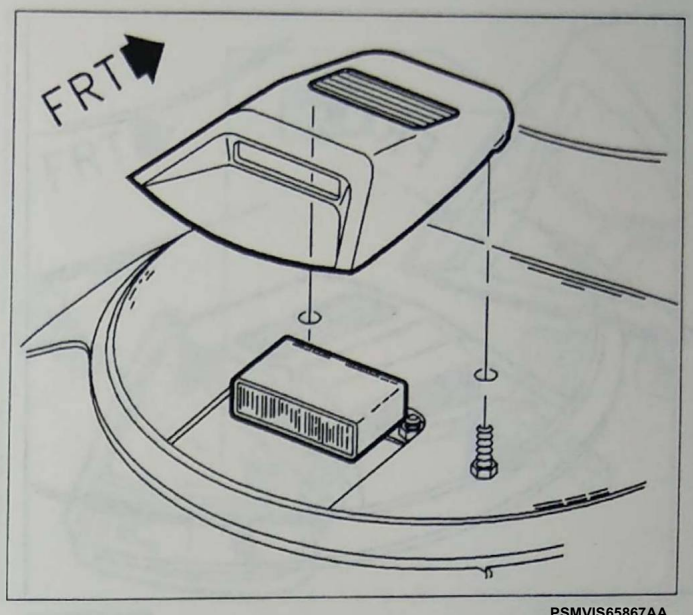
7FNTER HIGH MOUNT g_TOp LAMP ASSEMBLY (CHMSL)

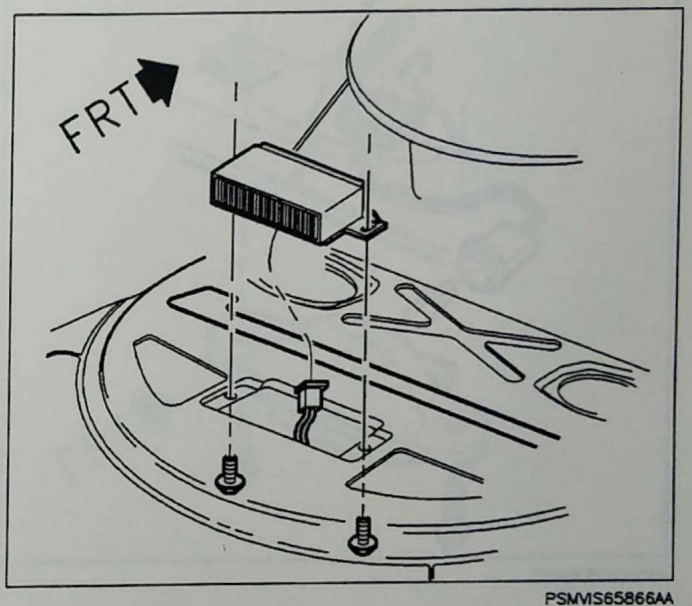


PSMVIS65867AA

REMOVAL

1. Remove bolts in rear compartment from center high mount stop lamp assembly (CHMSL) cover.

2. Disconnect CHMSL wire harness connector from inside rear compartment.
   a. Remove bolts from CHMSL lamp housing from inside rear compartment.
   b. Remove lamp housing from inside rear compartment.
3. Remove CHMSL cover from inside the vehicle.

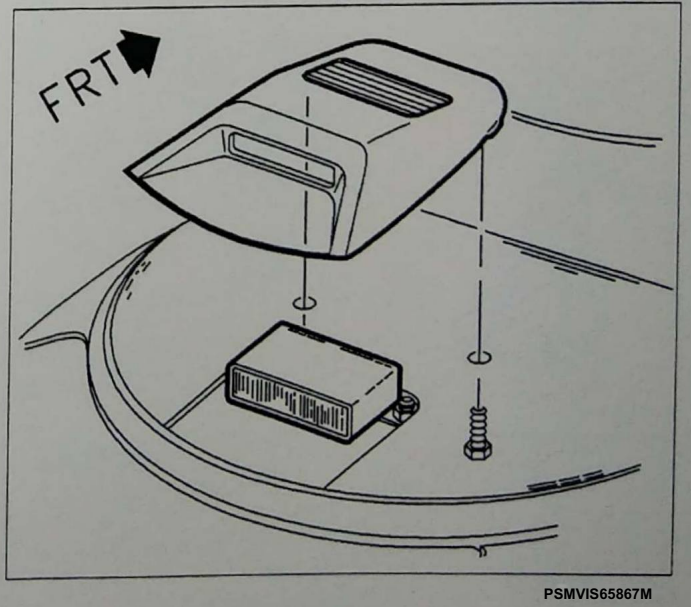


PSMVIS65866AA

INSTALLATION

1. Position CHMSL housing and cover to opening in package shelf inside the vehicle.
2. Connect center high mount stop lamp connector.

3- Loosely install bolts from inside trunk to housing and cover.



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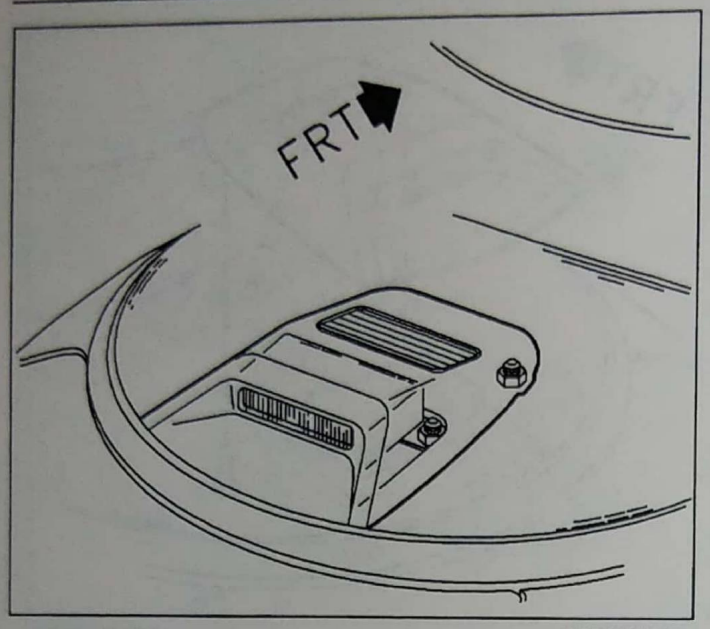

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Adjust CHMSL cover to back glass and tighten CHMSL bolts.

Torque: 1.5 N*m (13 in —lbs)

5. Adjust CHMSL housing rearward and center with the cover and tighten CHMSL housing bolts n'n

Torque: 8 N*m (71 in—lbs)

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TAIL LAMP

pEMOVAL

1 nCrnove screws and pull lamp straight back and out of rear quarter outer panel opening.

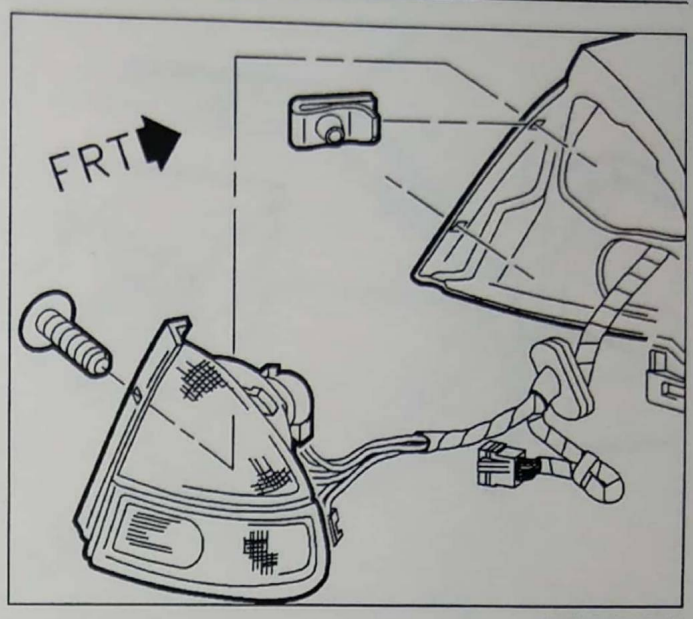
2. Disconnect bulb sockets and remove tail lamp assembly.

INSTALLATION

] Connect bulb sockets to tail lamp. Engage front retainer into rear quarter outer panel and push lamp into opening.

i Install lamp screws and tighten screws. Torque as specified.

Torque: 1.5 N«m (20 in-lbs)



PSMGEP66542AA

LICENSE PLATE LAMPS

REMOVAL

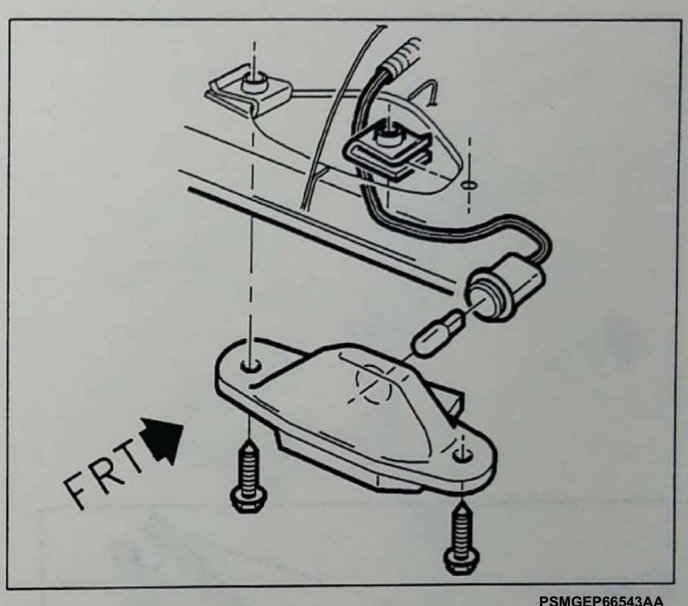
1. Open and raise rear compartment lid.
2. Remove retaining screws from each lamp assembly.
3. Disconnect bulb sockets from license plate lamp assemblies.

INSTALLATION

1. Install bulb sockets to each license plate lamp assemblies.
2. Install license plate lamp to deck lid retaining screws. Torque as specified.

Torque: 1.5 N*m (20 in—lbs)

3. Lower and close rear compartment lid assembly.



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SIR SYSTEM

ON VEHICLE SERVICE

SERVICE PRECAUTIONS

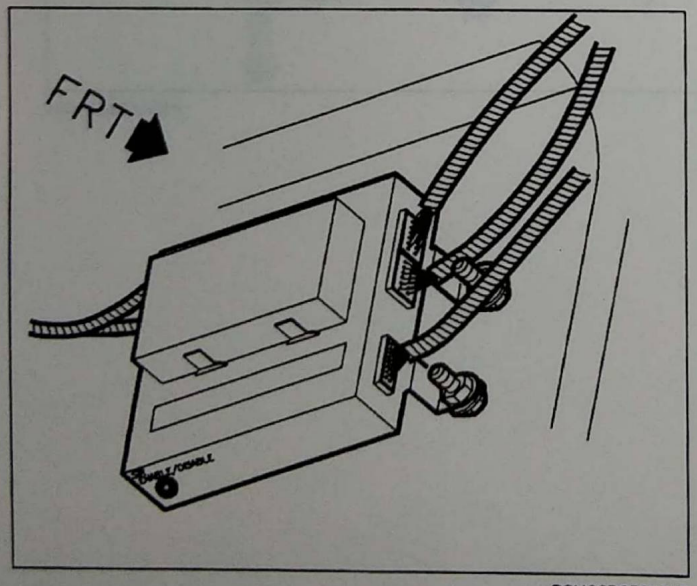
CAUTION: WHEN PERFORMING SERVICE ON OR AROUND SIR COMPONENTS OR SIR WIRING FOLLOW THE PROCEDURE BELOW TO TEMPORARILY DISABLE THE SIR SYSTEM. FAILURE TO FOLLOW PROCEDURES COULD RESULT IN POSSIBLE AIR BAG DEPLOYMENT, PERSONAL INJURY OR OTHERWISE UNNEEDED SIR SYSTEM REPAIRS.

THE SENSING AND DIAGNOSTIC MODULE (SDM) CAN MAINTAIN SUFFICIENT VOLTAGE TO CAUSE A DEPLOYMENT FOR UP TO *10 MINUTES* AFTER THE KEY PAD HAS BEEN PLACED IN THE "LOCK" MODE, ALSO IF THE AUXILIARY BATTERY IS DISCONNECTED OR THE SIR "ENABLE/DISABLE" SWITCH IS PLACED IN THE DISABLE POSITION. MANY OF THE SERVICE PROCEDURES REQUIRE THE SIR "ENABLE/DISABLE" SWITCH TO BE PLACED IN THE "DISABLE" POSITION AND DISCONNECTION OF THE DEPLOYMENT LOOPS TO AVOID AN ACCIDENTAL DEPLOYMENT.

DISABLING THE SIR SYSTEM

1. Turn the steering wheel so that the vehicle's wheels are pointing straight ahead.
2. Place the key pad in the **LOCK** mode.
3. Place the SIR **"ENABLE/DISABLE"** switch in the right hand junction block in the **DISABLE** position.

IMPORTANT: With the SIR **ENABLE/DISABLE** switch in the **DISABLE** position and the key pad in the RUN mode, the AIR BAG telltale lamp will be "On." This is normal operation and does not indicate an SIR system malfunction.



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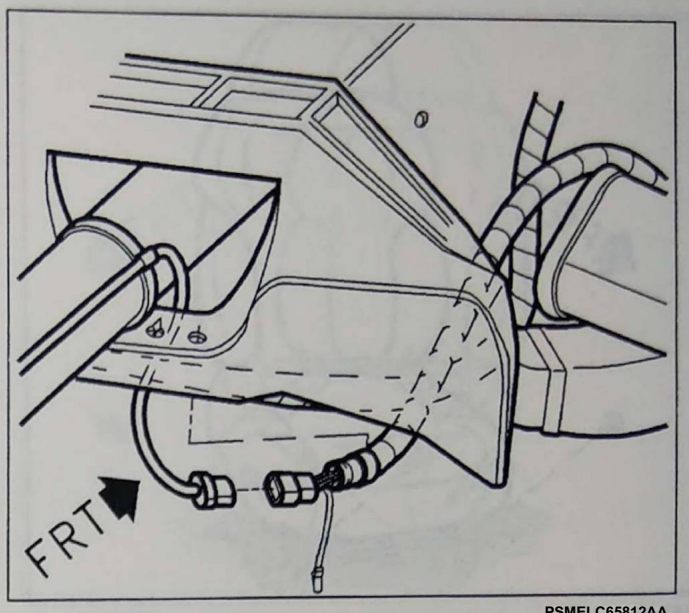
4. *Remove connector position assurance (CPA) device and disconnect yellow two-way connector located* near the base of the steering column.



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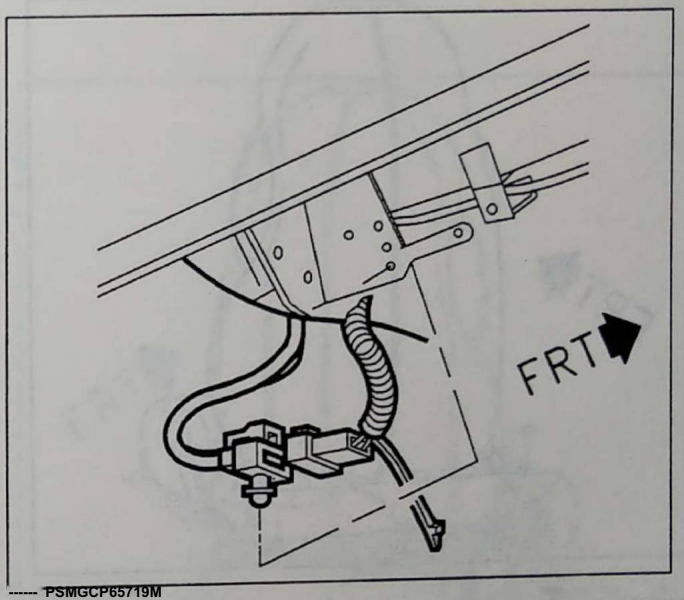
5 Remove connector position assurance (CPA) device and disconnect yellow two-way connector located on passenger inflator module pigtail under RH side of

UP-



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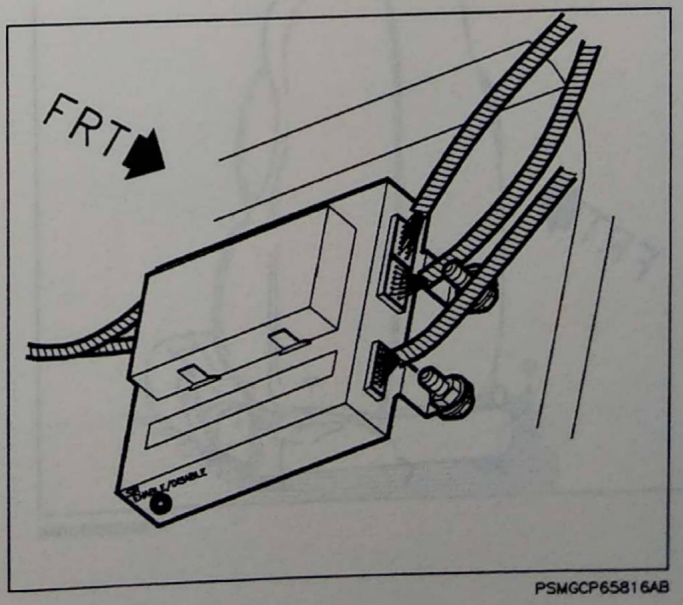
ENABLING THE SIR SYSTEM

1. Place key pad in the **LOCK** mode.
2. Connect yellow two-way SIR connector at the base of steering column and install connector position assurance (CPA) device to connector.
3. Connect yellow two-way passenger inflator module pigtail and install connector position assurance (CPA) to connector.
4. Place SIR **ENABLE/DISABLE** switch to the **ENABLE** position, located in the RH junction block.
5. Place key pad in the "RUN" mode and verify that the AIR BAG telltale lamp flashes seven times a key pad is placed in the "RUN" mode and then goes Off- If lamp does not operate as described a o' b ve perform the "SIR Diagnostic System Check in t" his manual.



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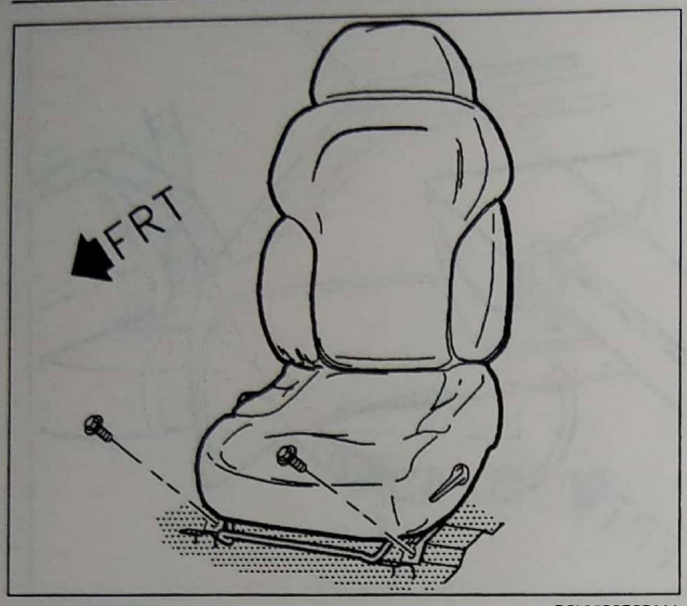
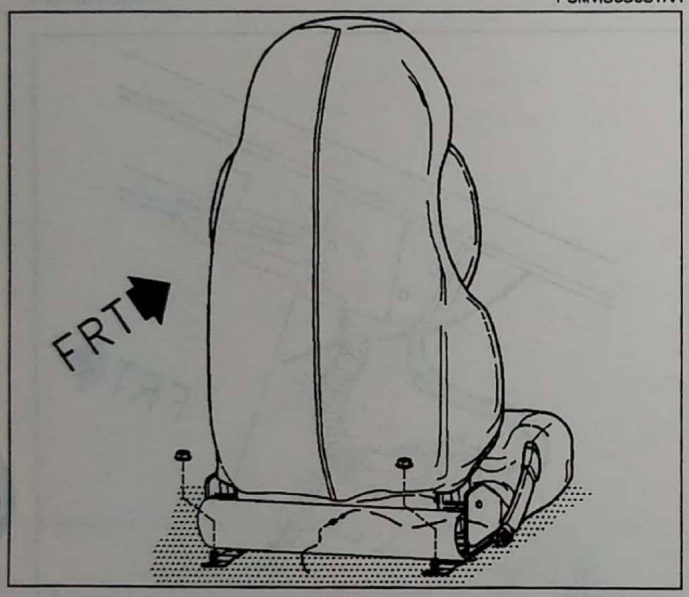
SEAT ASSEMBLY



PSMVIS65681AA

REMOVAL

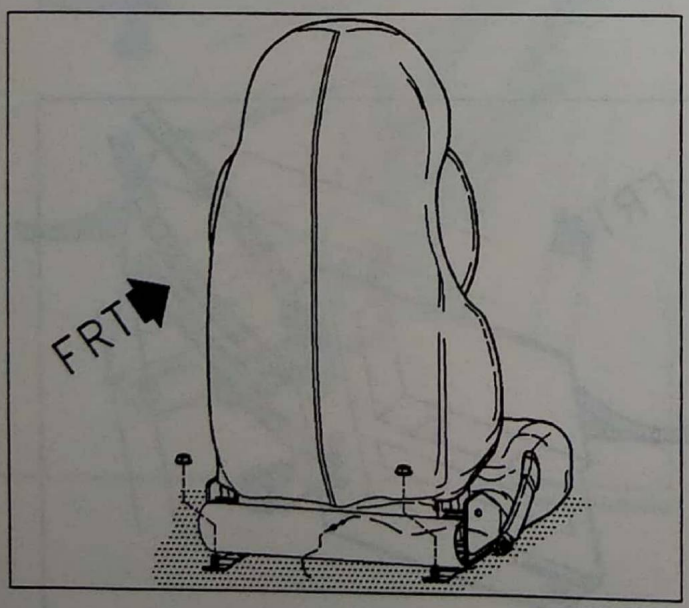
1. Position seat rearward and remove bolts from front of seat tracks.



PSMVIS65680AA

2. Position seat to forward position. Remove nuts from rear seat track studs.
3. For driver's seat, disconnect seat side mount seat belt buckle wiring connector.
4. Lift seat off rear seat track studs, remove seat from vehicle.

NOTICE: Place seat on clean, protected work surface.



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INSTALLATION

NOTICE: Use new nuts; torque retention of old nuts may not be sufficient.

1. Guide rear seat track legs through slits in carpet and onto studs. Hand start new nuts. Do not tighten.
2. For driver's side, connect seat side mount buckle unit wiring connector to drivers side only.

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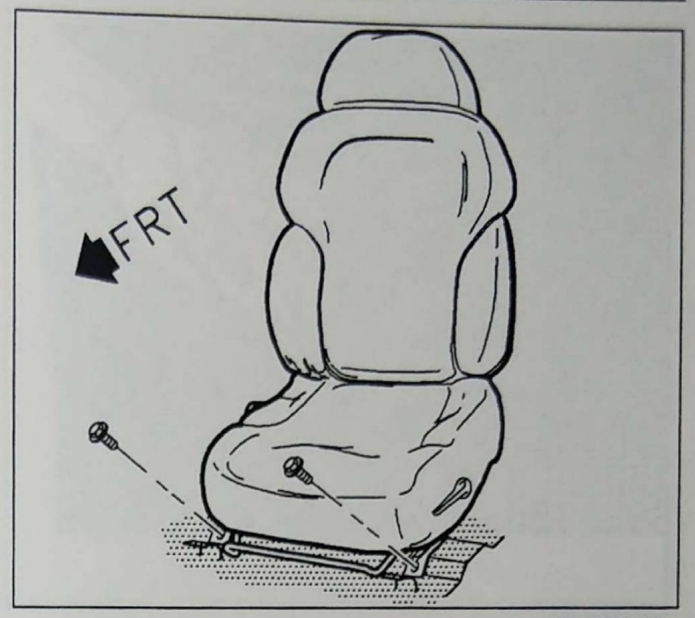
NOTICE: Use new bolts; torque retention of old bolts may not be sufficient.

3. position seat rearward on seat tracks. Align front scat track bolt holes to 2-bar.

4. Install new bolts to front inner and outer seat tracks.

Torque: 25 N*m (19 ft-lbs)

5. Tuck carpet under front seat track carpet retainer.

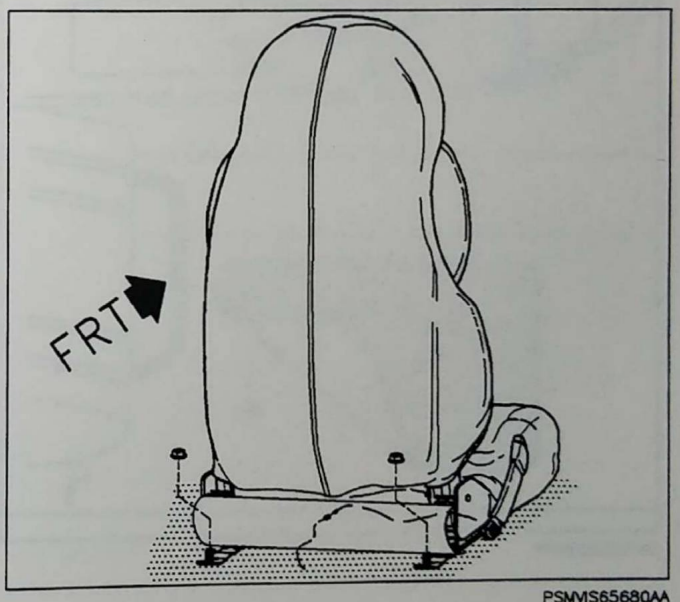


PSMVIS65681AA

6. Position seat forward on seat tracks, fold carpet forward to expose rear seat track legs and studs. Torque nuts onto inner and outer seat track studs, fold carpet back over rear legs and studs.

Torque: 50 N*m (37 ft—lbs)

7. Verify seat moves on tracks without binding.



PSMVIS65680AA

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RECLINER MECHANISM CHECK

1. Lift recliner lever and move seat back to the fully reclined position, checking the ease of lever operation and seat back movement. Release lever, checking ease of lever operation and that seat back remains in fully reclined position. The recliner lever should move easily and feel spring loaded.
2. Lift recliner lever and position seat back in partially reclined position. Release recliner lever, checking that recliner mechanism engages and holds seat back in chosen position. Apply force to seat back checking how well mechanism engages and locks in place. The mechanism should not slip out of place when force is applied.
3. Lift recliner lever and position seat back in normal operating position. Release recliner lever, checking that recliner mechanism engages and holds seat back in normal operating position. Apply force to seat back checking how well mechanism engages and locks in place.
4. If recliner mechanism fails to hold seat back in any of the above described positions, replace seat assembly.

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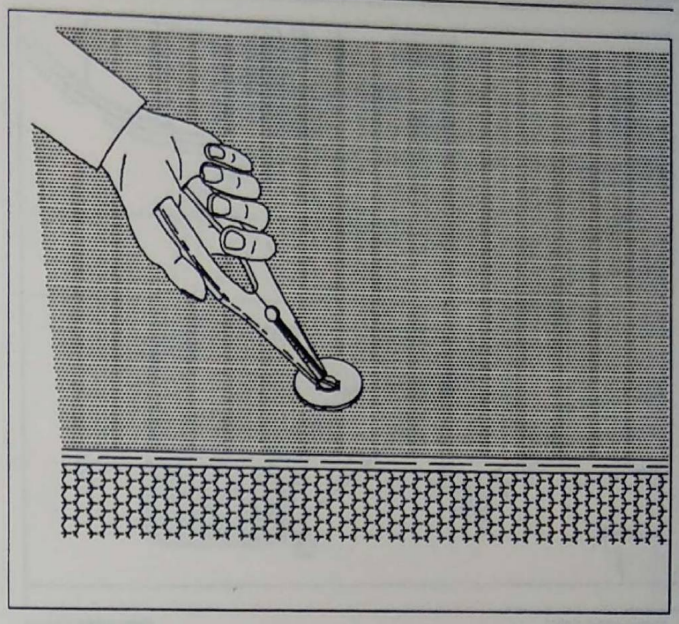
CARPET

FLOOR MAT

REMOVAL

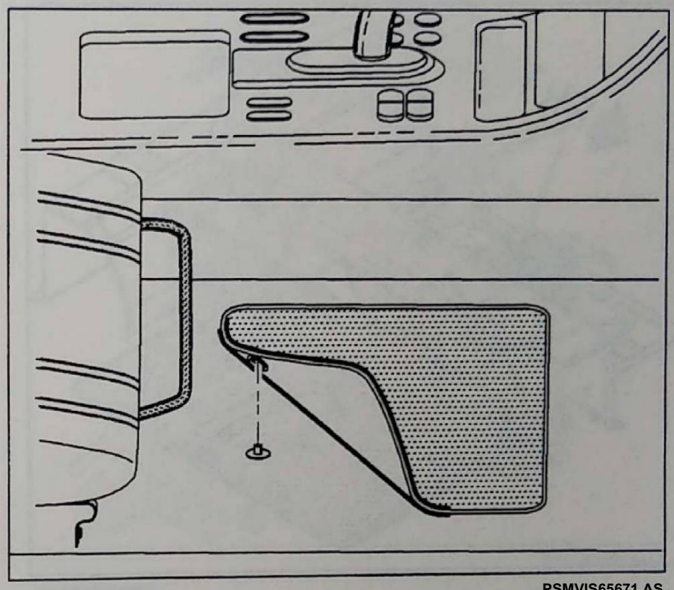
Saueeze floor mat retainer together and lift up on floor mat to release floor mat from retainer.



PSMVIS65670AA

INSTALLATION

Install floor mat over floor mat retainer and push on retainer till click noise is heard and floor mat is secured to retainer.

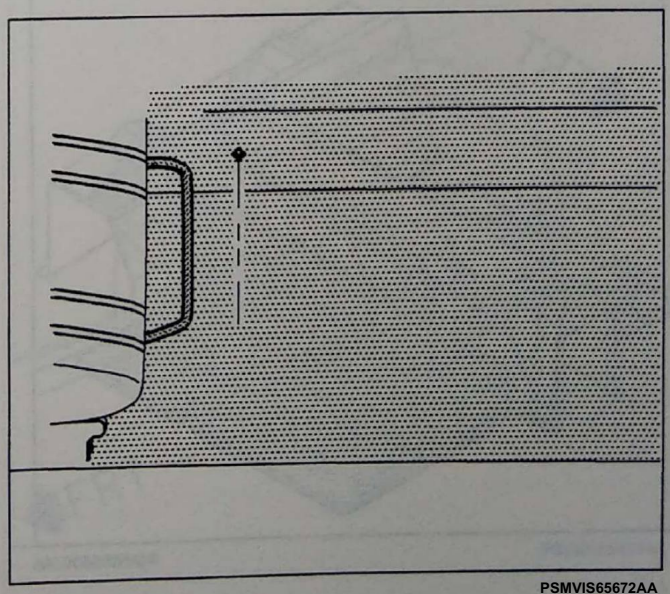


PSMVIS65671 AS

FLOOR MAT RETAINER

REMOVAL

Unscrew floor mat retainer from carpet assembly.



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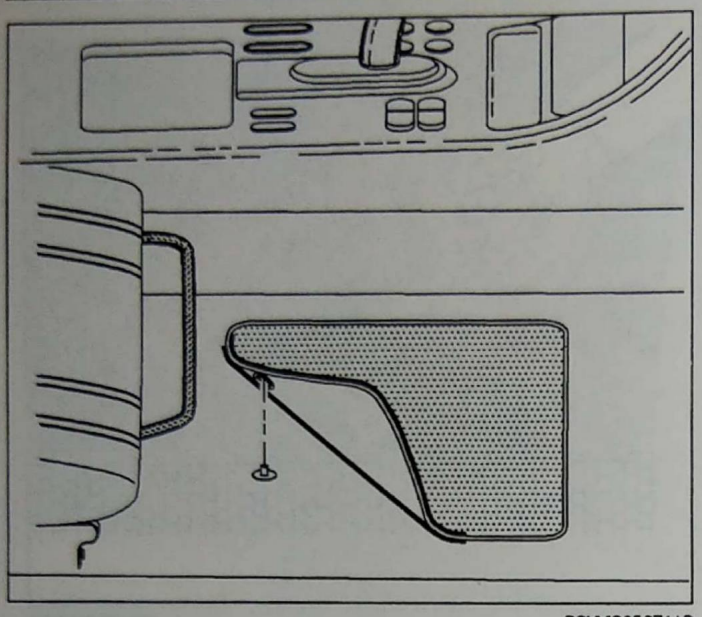


PSMVIS65671AB

INSTALLATION

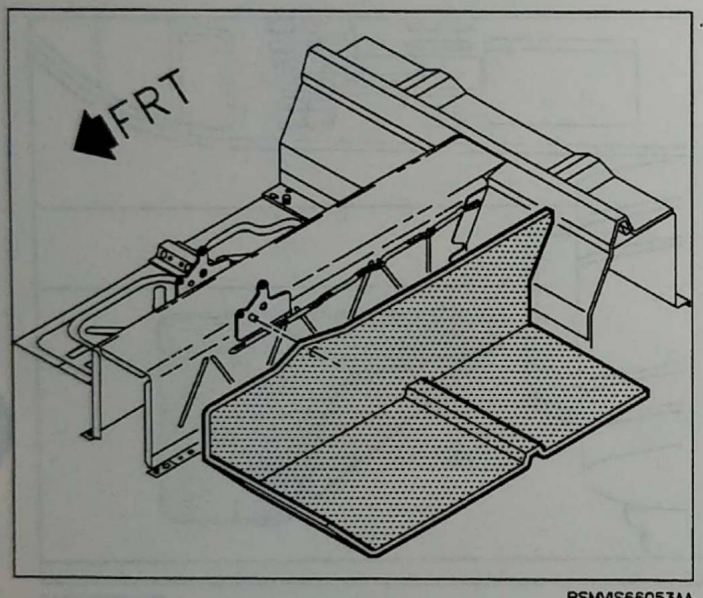
Position floor mat in car-mark location on floor carpet. Screw in self tapping carpet retainer into carpet assembly.

CARPET FRONT FLOOR - LEFT AND RIGHT SIDE

REMOVAL

The front floor carpet is molded in two parts, a right and left side carpet. This procedure is for removal of either right or left side carpet and components that need to be removed from right or left side only.

1. Remove seat. (Refer to "Seat" removal procedure in this manual.)
2. Remove instrument panel. (Refer to "Instrument Panel" removal procedure in this manual.)
3. Remove lower seat belt anchor bolt at floorpan.
4. Remove carpet, starting at tunnel, releasing adhesive along tunnel. Remove carpet from vehicle.



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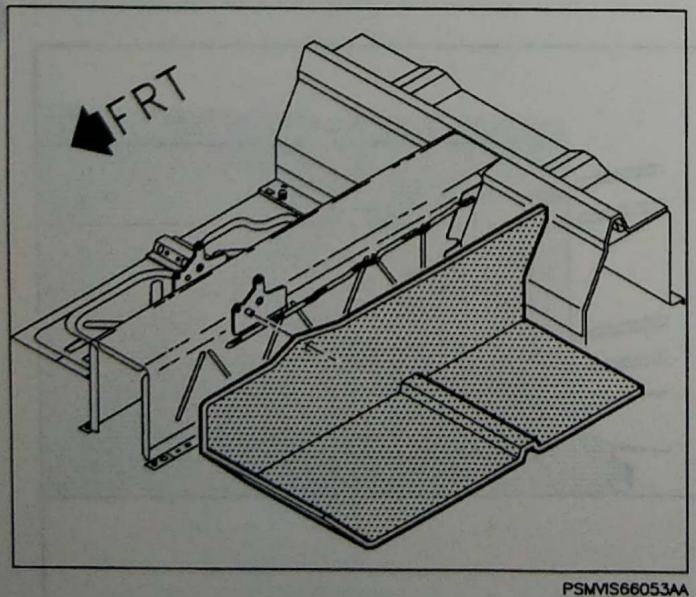

PSMVIS66053AA

INSTALLATION

1. Apply 3M® Supertrim Adhesive P/N 08090 or equivalent to the vertical side of the tunnel and the vertical tunnel portion on the carpet.
2. Align carpet hole over locating pin on tunnel bracket and door opening. On driver's side, tuck carpet around trunk release handle.

NOTICE: Use new bolts; torque retention of old bolts may not be sufficient.

3. Install lower seat belt anchor to floorpan with new bolt.

Torque: 41 N*m (30 ft-lbs)

4. Install instrument panel. (Refer to "Instrument Panel" installation procedure in this manual.)
5. Install seat. (Refer to "Seat Assembly" installation procedure in this manual.)

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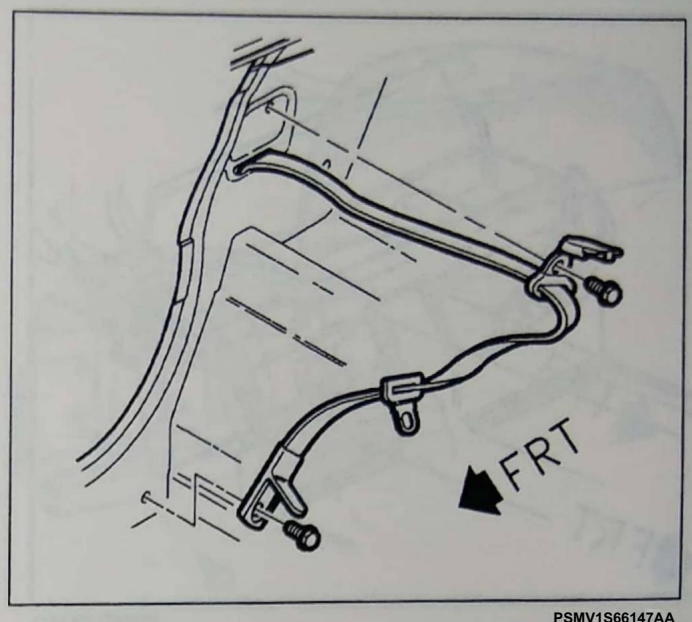
CARPET REAR FLOOR

REMOVAL

1. Remove lower seat belt anchor bolt at floor pan.
2. Pry clip D-ring cover from upper seat belt anchor.
3. Remove upper seat belt anchor bolt.



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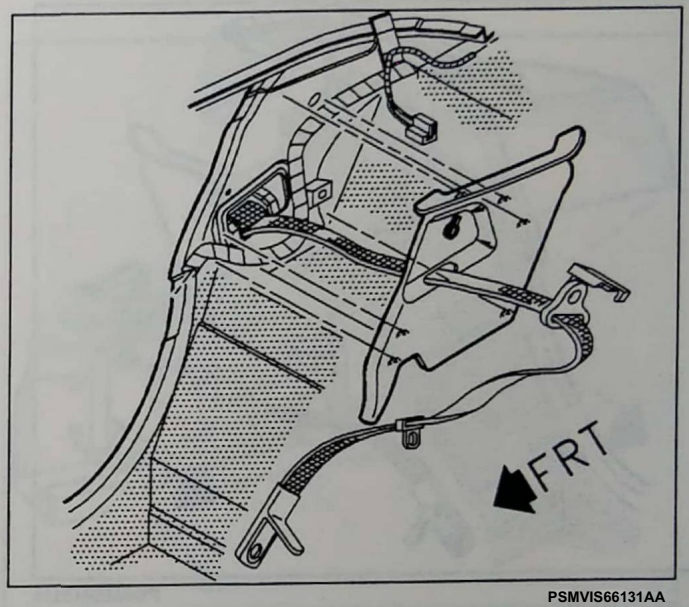
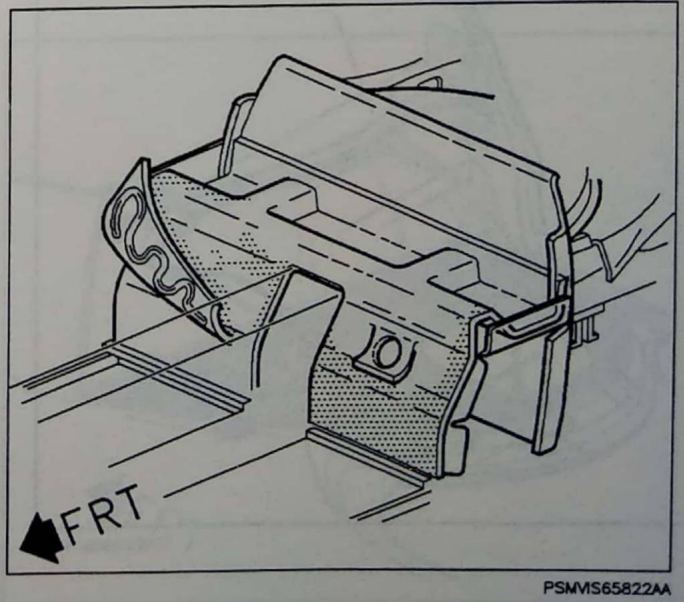
4. Starting at bottom of quarter upper trim panel, pull firmly on trim panel at clip locations to release clips.
5. Disconnect wire harness to accessory power outlet plug housing on right side.
6. Feed seat belt through trim panel.



PSMVIS66131AA

7. Starting at top of rear carpet, remove carpet from under rear package shelf tray. Loosen hot melt adhesive at bottom of carpet near the floor.

8- Remove rear carpet from vehicle.



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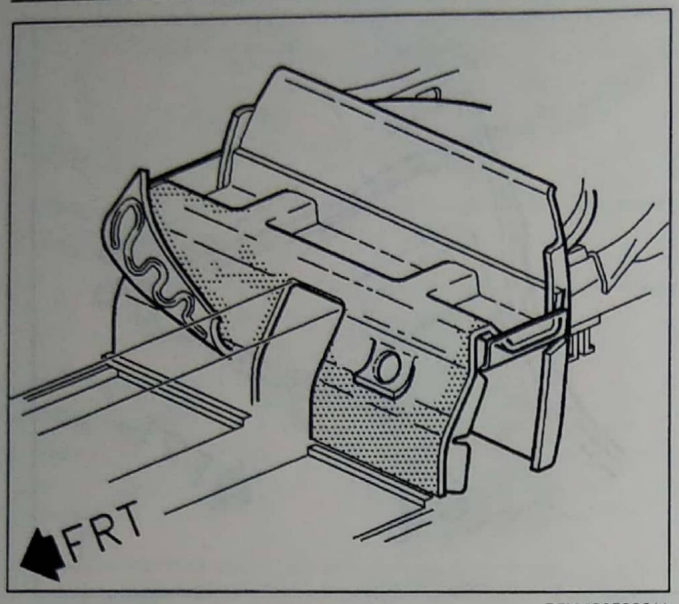

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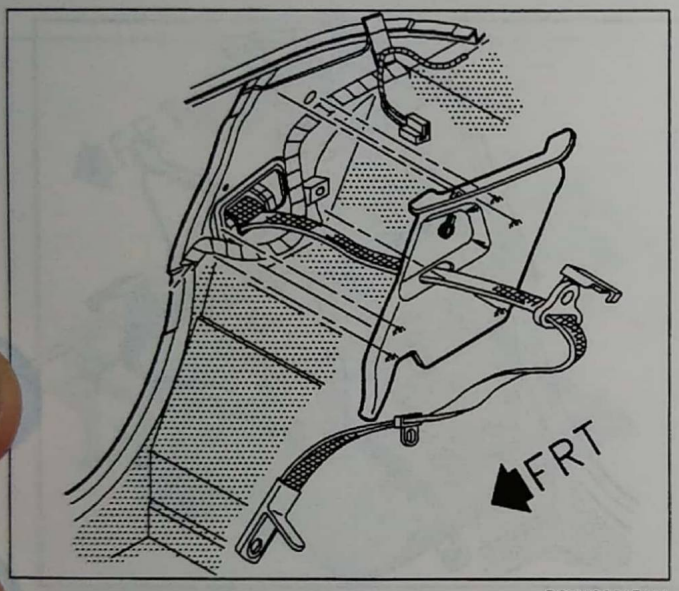

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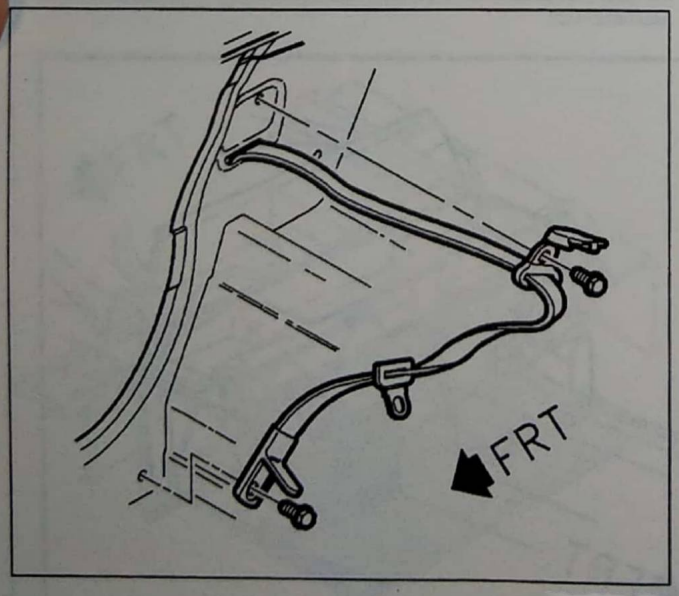

PSMVIS66147M

INSTALLATION

1. Apply 3M® Supertrim Adhesive P/N 08090 or equivalent to the vertical side of the tunnel and the vertical tunnel portion on the carpet.
2. Center carpet over tunnel and align to rear shelf, pressing firmly to set adhesive.
3. Lift rear shelf tray and tuck carpet under shelf tray.
4. Route seat belt through trim panel. Make sure belt is not twisted.
5. Connect wire harness to accessory power outlet plug housing on right hand side.
6. Align clips on trim panel to slots in body and press firmly at clip locations to seat.

NOTICE: Use new bolt; torque retention of old bolt may not be sufficient.

7. Position seat belt D-ring to body attachment point and hand start new bolt. After bolt is started, tighten bolt.

Torque: 41 N*m (30 ft-lbs)

8. Close upper sear belt anchor cover on D-ring

NOTICE: Use new bolts; torque retention of old bolts may not be sufficient.

9. Position lower seat belt to floor pan attachment point and hand start new bolt. After bolt is started, tighten bolt.

Torque: 41 N*m (30 ft-lbs)

10. Check seat belt unit installation for twists and operation of retractor.

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REAP WINDOW TRIM PANEL

pEMOVAL

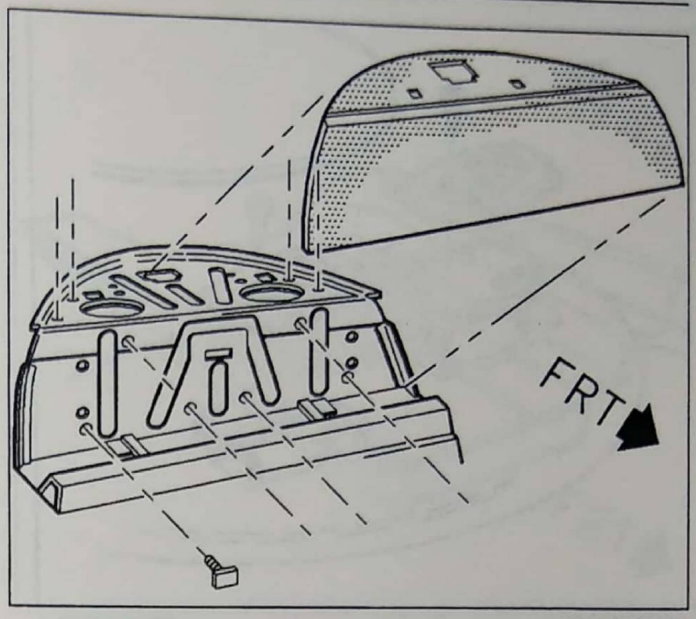
1 Remove center high mount stop lamp. (Refer to "Center High Mount Stop Lamp" removal procedure in this manual.)

2. Remove coat hooks. (Refer to "Coat Hook" removal - procedure in this manual.)

3. Remove upper quarter trim panels. (Refer to "Upper Quarter Trim Panel" removal procedure in this manual.)

4 Starting at bottom of vertical portion of package shelf tray panel, release Dual-Lock retainers by lifting outward to front of vehicle.

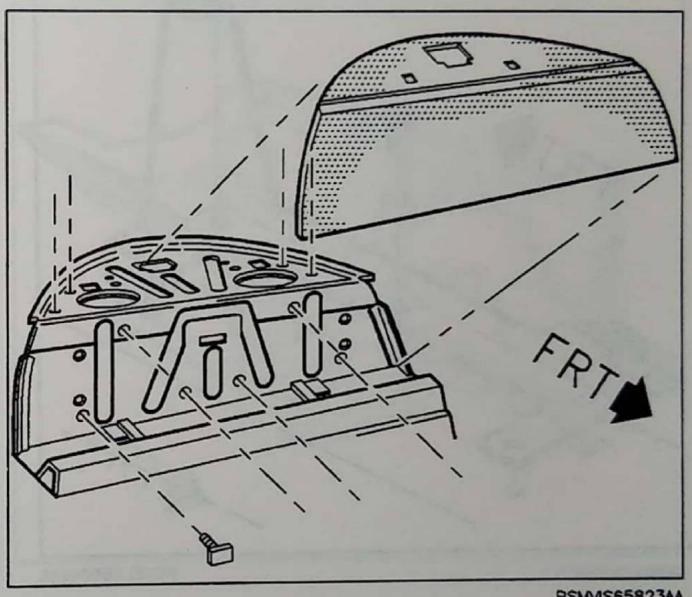
«> 5. Release horizontal portion of package shelf tray panel by lifting upward to release Dual-Lock retainers. Remove panel from vehicle.



PSMVIS65823AA

INSTALLATION

1. .Align trim panel to horizontal shelf and secure Dual-Lock retainers with hand pressure.
2. Secure Dual-Lock retainers on vertical portion of trim panel with hand pressure.
3. Install upper quarter trim panel. (Refer to "Upper Quarter Trim Panel" installation procedure in this manual.)
4. Install coat hooks. (Refer to "Coat Hook" installation procedure in this manual.)
5. Install center high mount stop lamp. (Refer to "Center High Mount Stop Lamp" installation procedure in this manual.)



PSMVIS65823AA

COAT HOOK

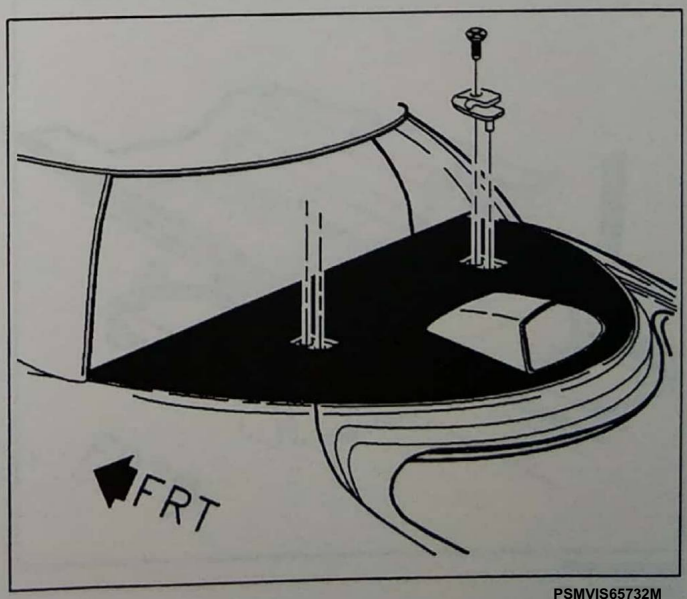
REMOVAL

1 • Remove screw from coat hook.

2. Lift coat hook off of package shelf tray.

'INSTALLATION

1. Align coat hook locator pin to horizontal portion on Package shelf tray.
2. Tighten screw.



PSMVIS65732M

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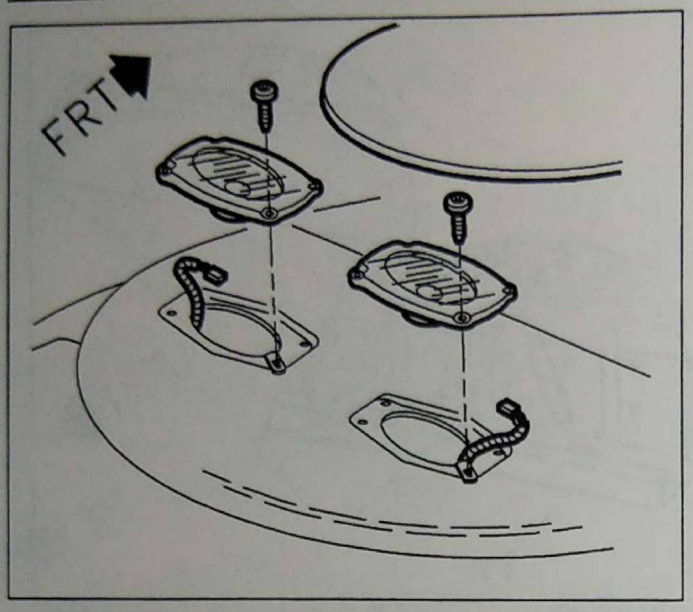
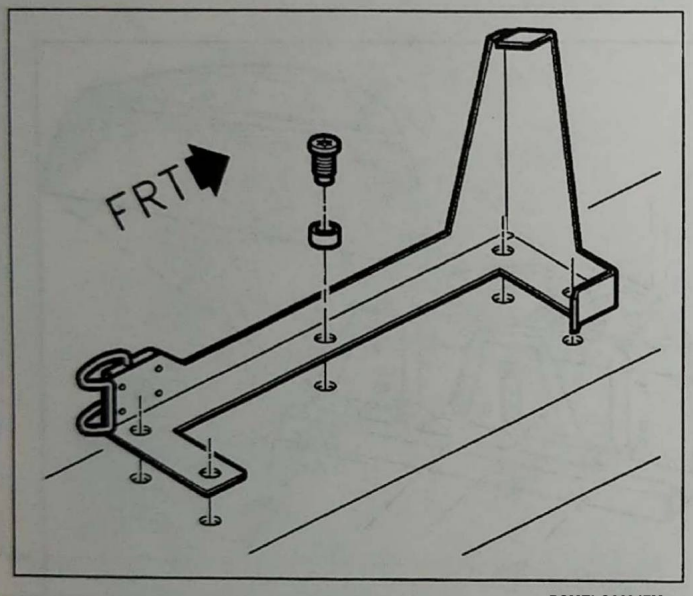


PSMELC65849AA



PSMELC66947M

REAR SPEAKERS

REMOVAL

1. Remove rear window trim panel. (Refer to “Rear Window Trim Panel” removal in this manual.)
2. Remove the speaker screws.
3. Remove speaker from packing shelf and disconnect electrical connector.

INSTALLATION

1. Connect speaker connector and install speaker into packing shelf.
2. Install speaker screws. Tighten screws.
3. Install rear window trim panel. (Refer to “Rear Window Trim Panel” installation in this manual.)

REAR COMPARTMENT CARPET

REMOVAL

1. Remove convenience charger from rear compartment.
2. Remove convenience charger bracket from floor of rear compartment.

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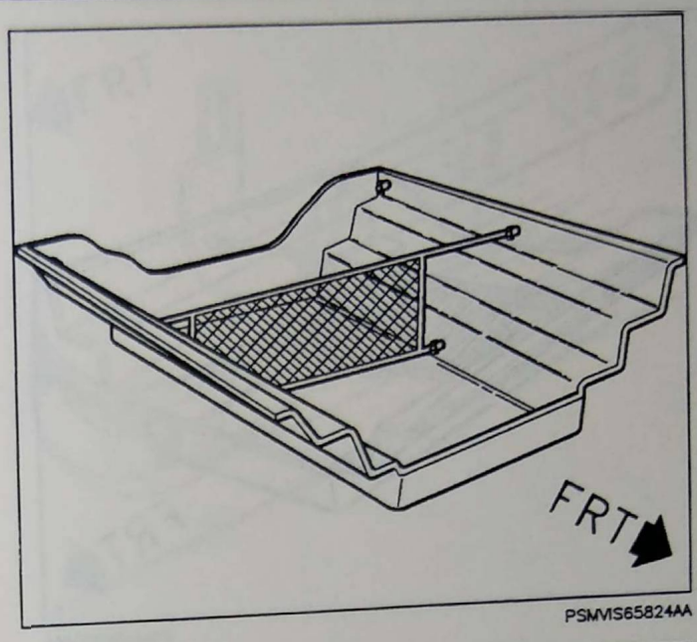
net and cargo net thumb screws.

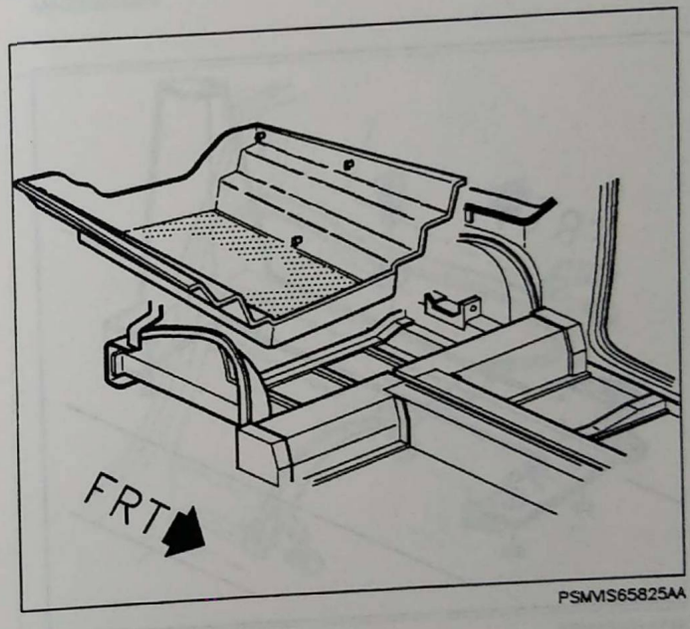
3- Remove cargo



PSMMS65824AA

4. Gently pull carpet around pressure relief valves.

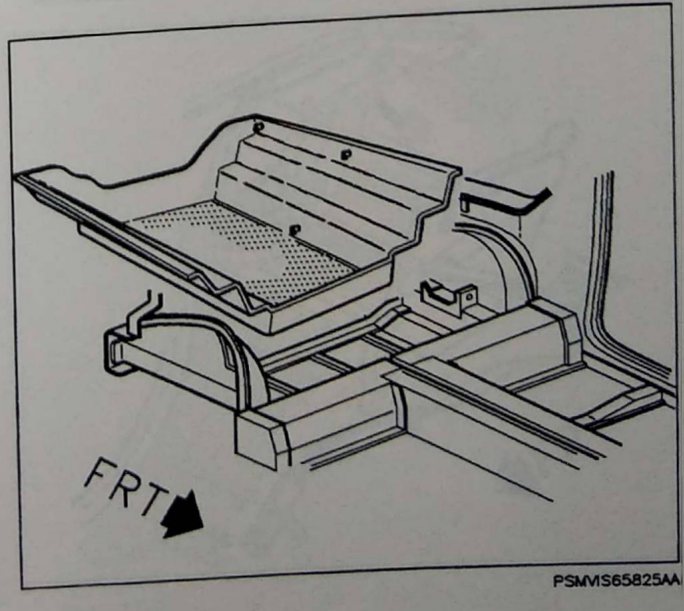
5. Remove carpet from rear compartment.



PSMMS65825AA

INSTALLATION

1. Align rear compartment carpet to rear compartment floor ensuring holes for convenience charger and cargo net thumb screws align with insert fasteners.
2. Position rear of carpet around rear compartment lock and under weather strip along rear compartment opening.
3. Position carpet along taillight area.
4- Fold side up and into place around taillight area.
5. Tuck carpet around pressure relief valves.



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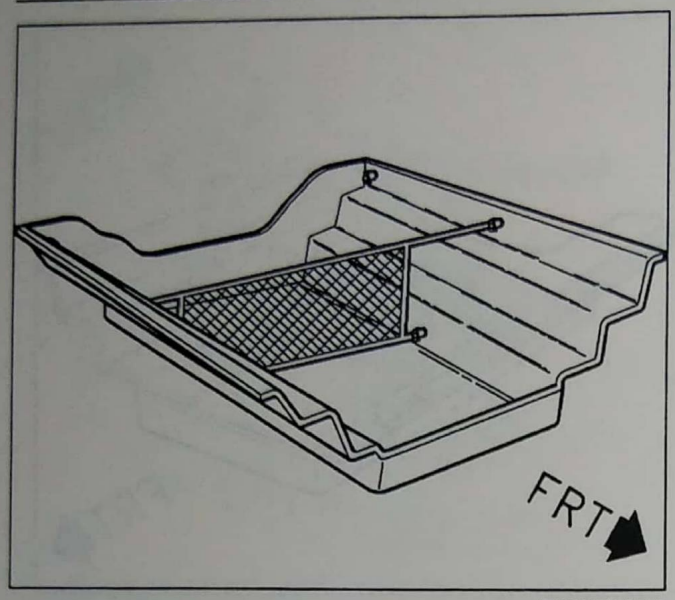
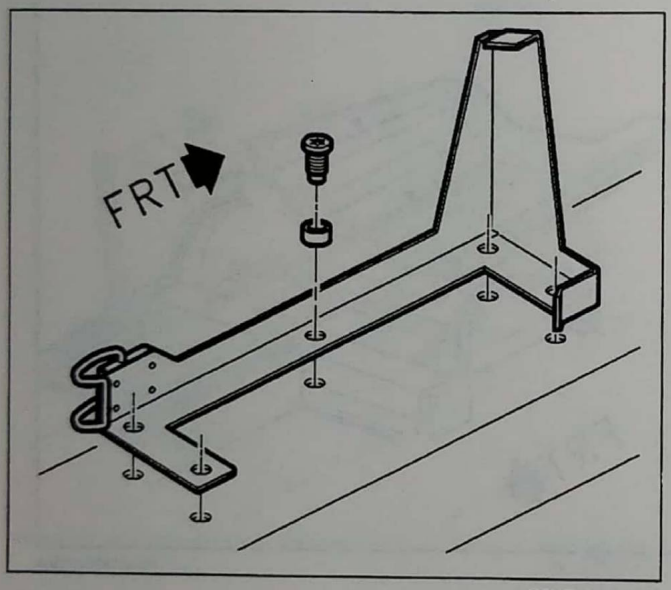


PSMVIS65824AA

6. Install cargo net thumb screws and cargo net.



PSMELC66947AA

7. Install convenience charger bracket and tighten screws.
8. Install convenience charger and latch into position.

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H/IOLDINGS

COONT SIDE DOOR OPENING
FLOOR CARPET RETAINER (SILL)

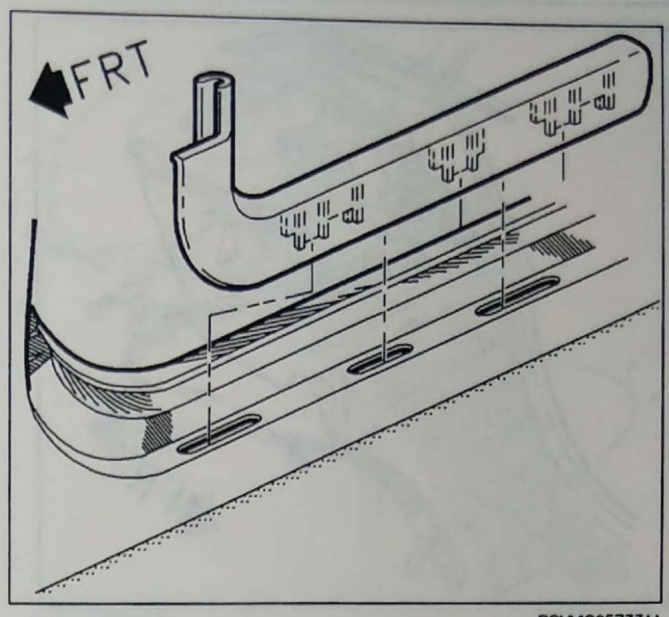
REMOVAL

Starting at rear of carpet retainer, pull firmly on carpet retainer at clip locations to disengage clips.

Remove front side door opening floor carpet retainer.

INSTALLATION

1. Locate carpet retainer to door opening.
2. Firmly seat carpet retainer into weatherstrip.
3. Snap clips into slots in inner rocker panel.

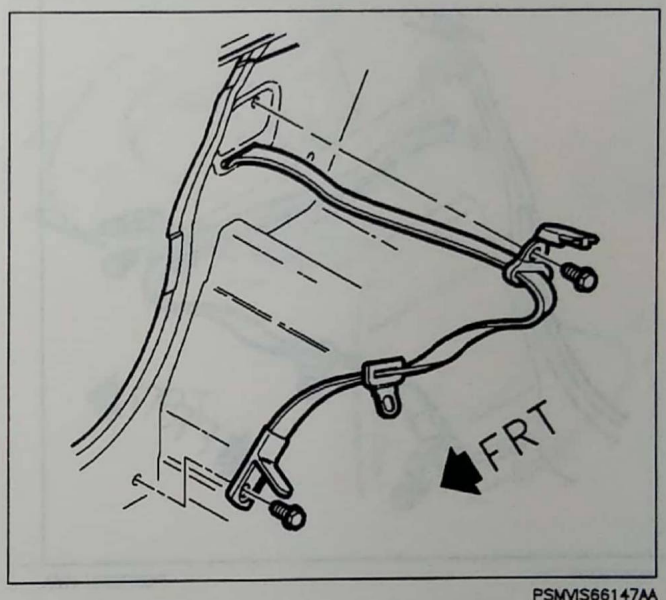


PSMVIS65733AA

QUARTER UPPER TRIM PANEL

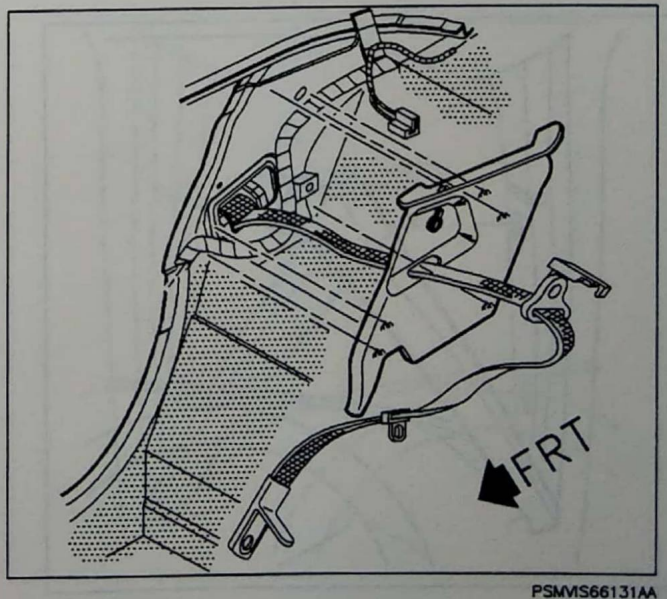
REMOVAL

1. Remove lower seat belt anchor bolt at floor pan.
2. Unclip D-ring cover from upper seat belt anchor.
3. Remove upper seat belt anchor bolt.



PSMVIS66147AA

4. Starting at bottom of quarter upper trim panel, pull firmly on trim panel at clip locations to release clips.
5. Disconnect wire harness to accessory power outlet Plug housing on right side.
6. Feed seat belt through trim panel.



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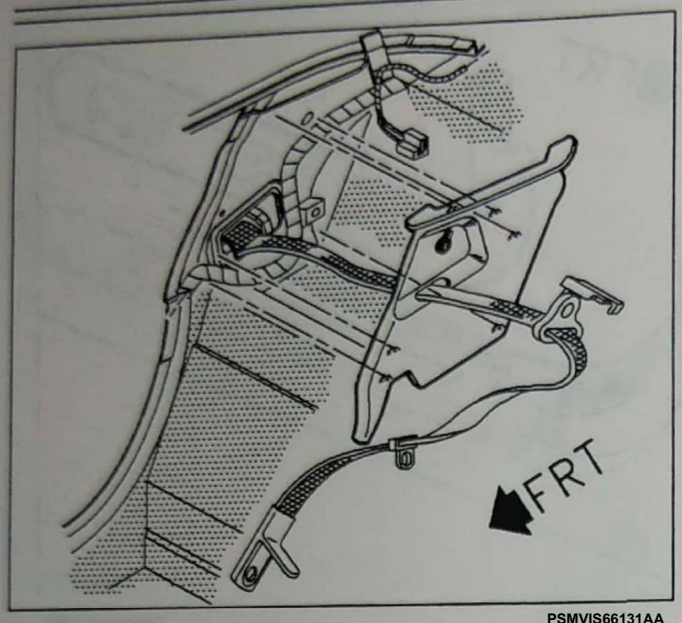


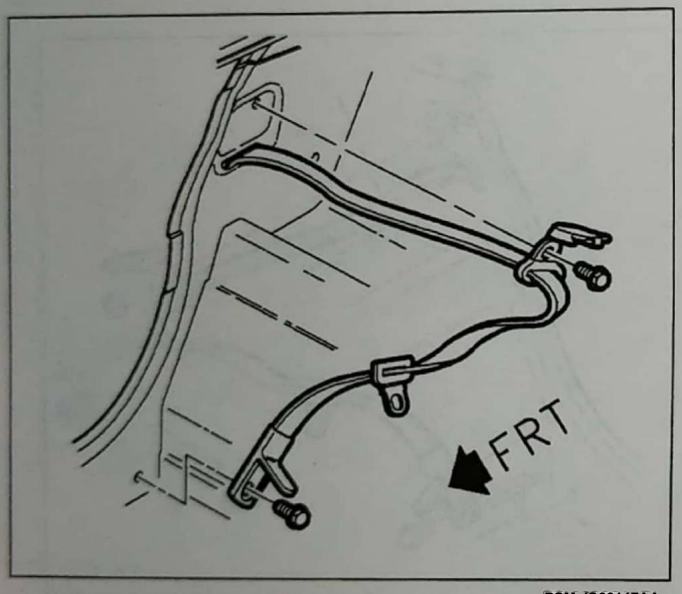
PSMVIS66131AA

INSTALLATION

1 Route seat belt through trim panel. Make sure belt is not twisted.

2. Connect wire harness to accessory power outlet plug housing on right hand side.

3. Align clips on trim panel to slots in body and press firmly at clip locations to seat.



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NOTICE: Use new bolt; torque retention of old bolt may not be sufficient.

4. Position seat belt D-ring to body attachment point and hand start new bolt. After bolt is started, tighten bolt.

Torque: 41 N*m (30 ft—lbs)

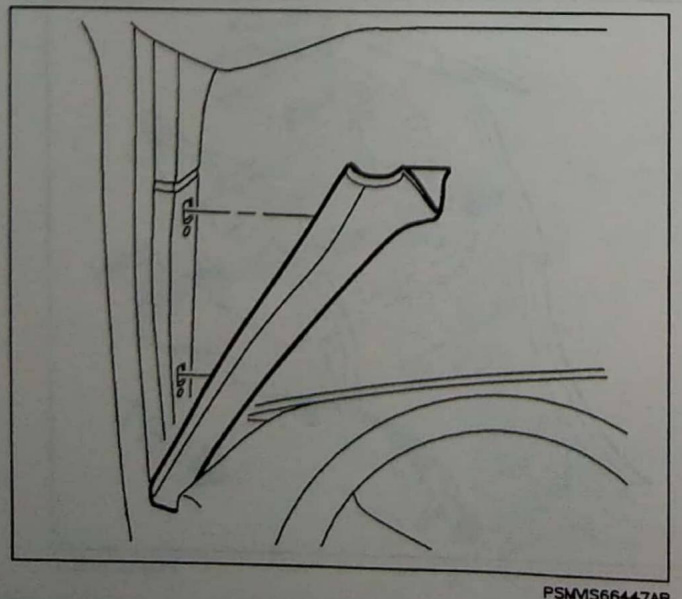
5. Close upper seat belt anchor cover on D-ring.

NOTICE: Use new bolt; torque retention of old bolt may not be sufficient.

6. Position lower seat belt to floor pan attachment point and hand start new bolt. After bolt is started, tighten bolt.

Torque: 41 N*m (30 ft—lbs)

7. Check seat belt unit installation for twists and operation of retractor.



PSMVIS66447AB

WINDSHIELD GARNISH MOLDING

REMOVAL

1. Starting at top of garnish molding, pull firmly at clip locations to disengage. Tipping the top of molding inward with the bottom engaged to instrument panel.

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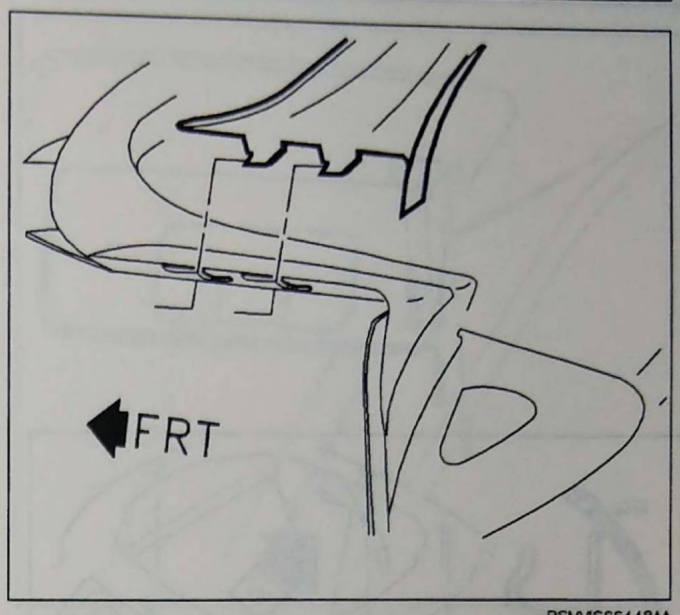
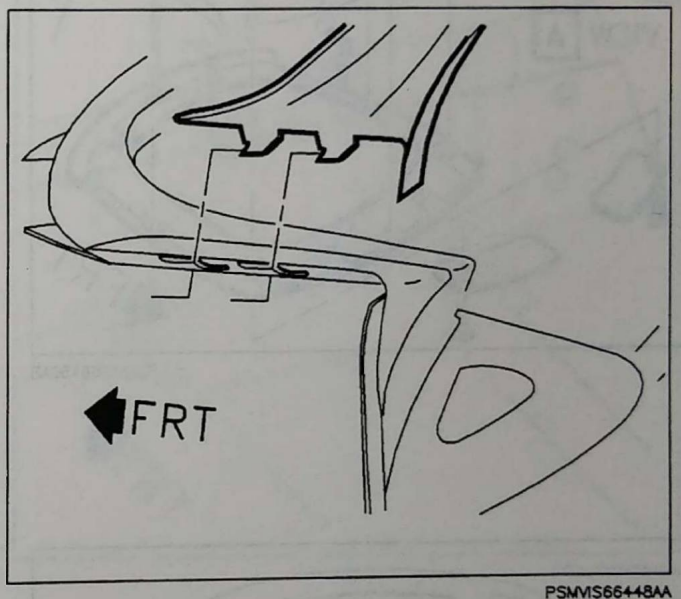
Disengage tabs on garnish molding from instrument 2- p$_{anc}$] by pulling rearward and inboard.



PSMVIS66448AA

INSTALLATION

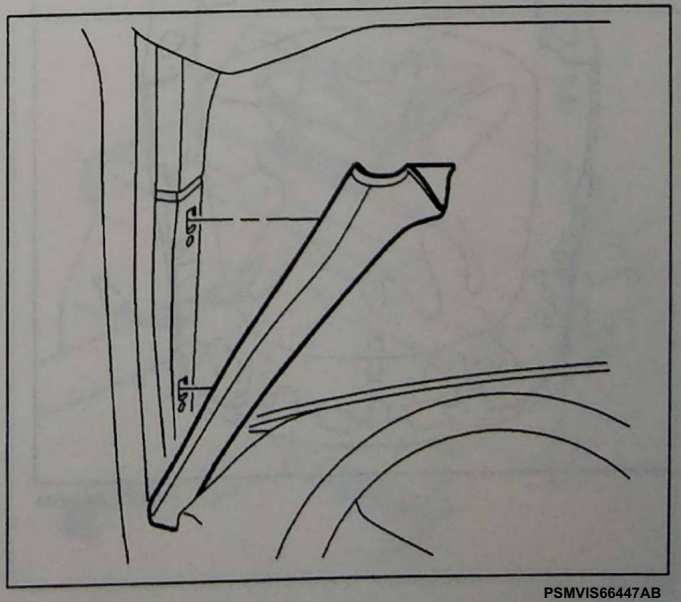
1. Insert tabs on bottom of garnish molding into instrument panel.
2. Push molding downward and forward past A-pillar structure.
3. Push molding to structure pressing forward and outward to insure proper fit to instrument panel, headlining and door seal.



PSMVIS66448AA

4- Align clips on garnish molding to slots in A-pillar and press firmly at clip locations.

5. Position flap on door weatherstrip over windshield garnish molding.



PSMVIS66447AB

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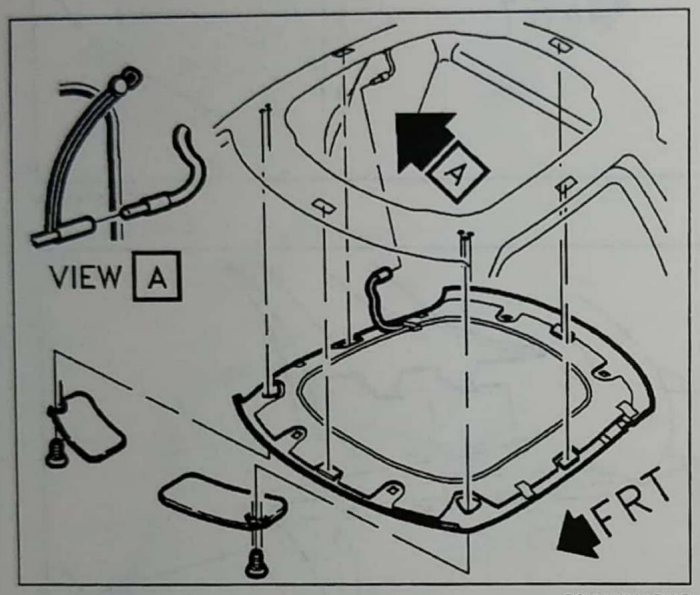
HEADLINER

REMOVAL

1. Remove sunshades. (Refer to "Sunshade" removal procedure in this manual.)
2. Remove upper quarter trim panel. (Refer to "Upper Quarter Trim Panel" removal procedure in this manual.)
3. Remove windshield garnish moldings. (Refer to "Windshield Garnish Molding" removal procedure in this manual.)
4. Remove headliner by disengaging Dual-Lock retainer in four locations.
5. Disconnect antenna lead at right sail panel.
6. Remove headliner from car.



PSMVIS66150AB

INSTALLATION

1. Position headliner in car.
2. Connect antenna lead at right sail panel.
3. Align and center headliner to roof, then press firmly at Dual-Lock retainer locations to retain headliner in position.
4. Position flap on door weatherstrip over headliner.
5. Install windshield garnish moldings. (Refer to "Windshield Garnish Molding" installation procedures in this manual.)
6. Install upper quarter trim panels. (Refer to "Upper Quarter Trim Panel Installation" procedure in this manual.)
7. Install sunshades. (Refer to "Sunshade Installation procedures in this manual.)

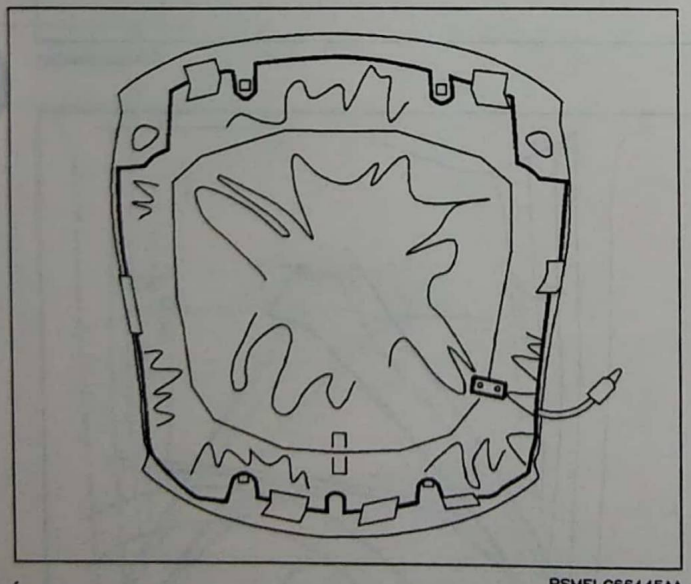
RADIO ANTENNA

REMOVAL

1. Remove headliner. (Refer to "Headliner" removal procedure in this manual.)

NOTICE: Use extreme care when removing connector and film from headliner so as not to cause damage. Repair or replace headliner as required.

2. Remove antenna film/connection from headliner.


PSMELC66445AA

INSTALLATION

1. Position headlining panel, cloth side down on a clean surface
2. Unroll antenna and position flat on headliner panel, with copper side of foil facing up. (Silver side against headliner.)
3. Align antenna on headliner so that the edge of the antenna is parallel with edge of headliner panel.
4. Use masking tape to secure antenna to headliner for installation into vehicle.
5. Install headliner. (Refer to "Headliner" installation procedure in this manual.)

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gUNSHADE

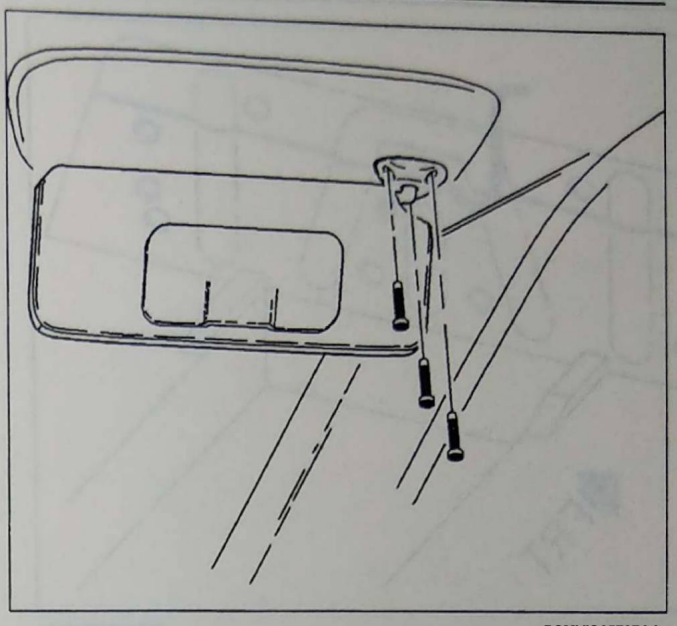
REMOVAL

1. Remove screws from sunshades.
2. Remove sunshade and spacer from vehicle.

INSTALLATION

j Install sunshade, using new sunshade spacers.

2. Install and tighten screws.

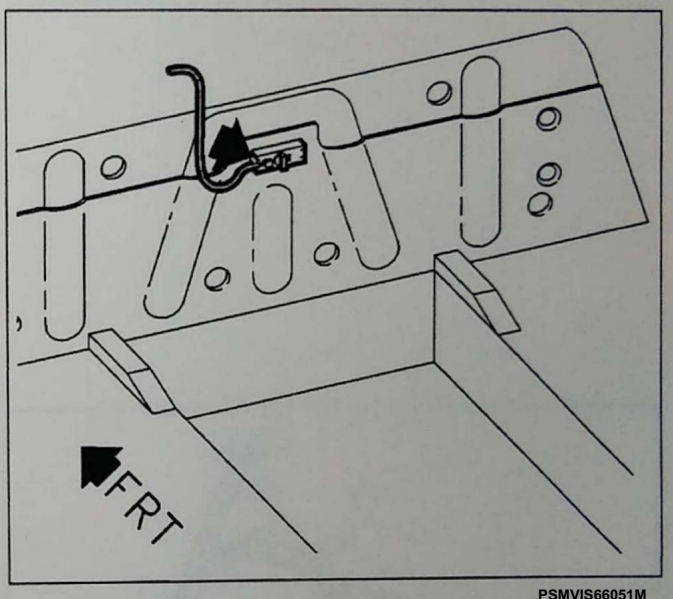


PSMVIS65737AA

COURTESY LAMP

REMOVAL

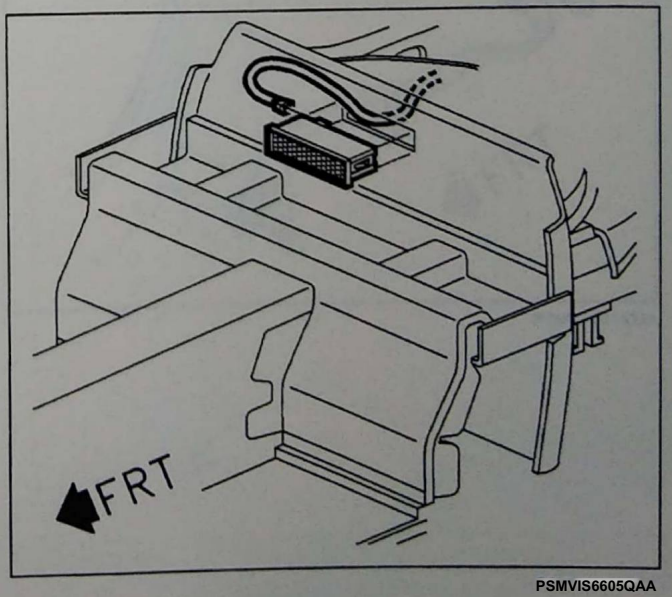
1. Disconnect courtesy lamp harness connector from inside rear compartment.
2. Release locking tabs on the side of courtesy lamp housing by squeezing tabs inward on housing from inside rear compartment.
3. Push to interior of vehicle.



PSMVIS66051M

'NSTALLATION

1. Connect courtesy lamp harness to lamp housing.
2. Install courtesy lamp into opening.



PSMVIS6605QAA

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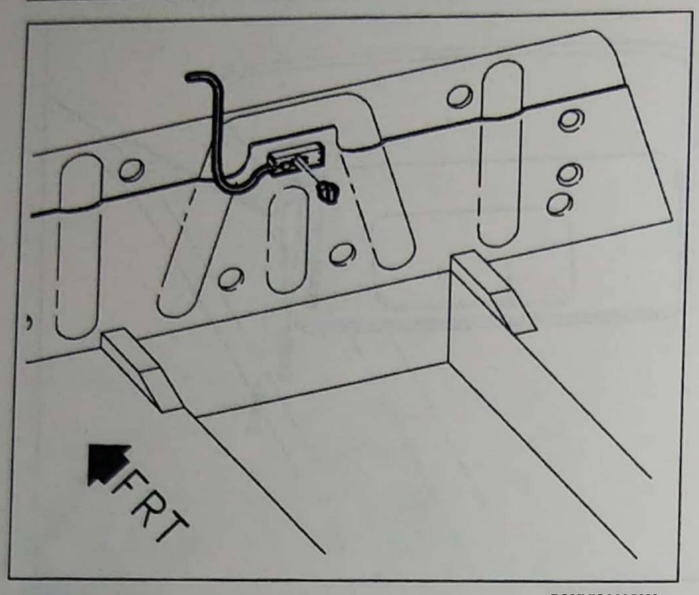

PSMVIS66052M

COURTESY LAMP BULB

REMOVAL

1. Turn bulb socket counterclockwise from inside rear compartment and remove from courtesy lamp housing.
2. Remove bulb from socket.

INSTALLATION

1. Install bulb into socket.
2. Insert bulb into courtesy lamp housing and turn clockwise until seated from inside rear compartment

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ACCESSORY 12 VOLT POWER OUTLETS

GENERAL DESCRIPTION

There is one accessory power outlet, it is located behind the passenger/upper trim, mounted in the right quarter panel.

The accessory power outlet can be used to plug in electrical equipment such as diagnostic tool, cellular telephone. CB radio, etc. Follow the proper installation instructions that are included with any electrical equipment to be installed.

The accessory power outlets always have power, even when the vehicle is in LOCK. Be sure you unplug or turn Off accessories plugged into either accessory power outlet. The vehicle is equipped with an "auxiliary" batten which is independent from the drive system batten pack. When vehicle is in LOCK mode, several accessories are powered directly from auxiliary battery (exterior lights, interior lights, and accessory power outlets). Leaving these accessories in for an extended period of time will discharge the auxiliary battery and could possibly result in a "no Run" condition. (Refer to electrical service manual for further information).

NOTICE: When using accessory' power outlets, the maximum load of any electrical equipment should not exceed 10 amps. Excess loads could cause "Positive Temperature Coefficient" (PTC) device to open causing no current flow.

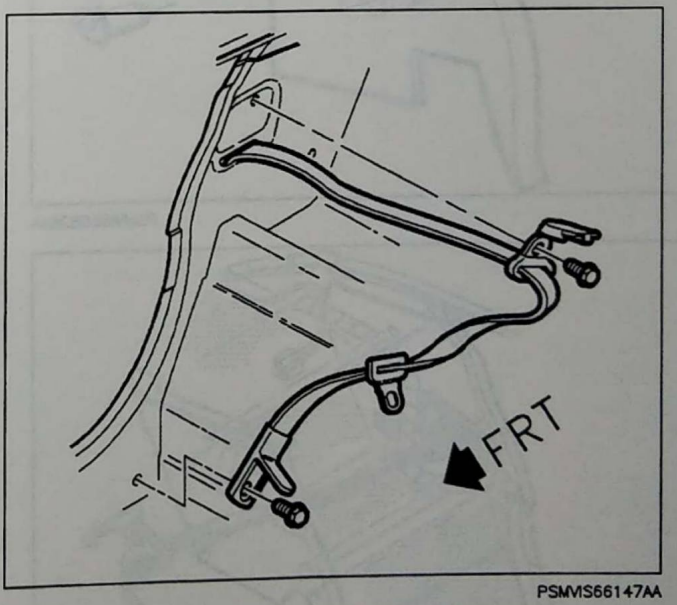
RIGHT SIDE QUARTER UPPER TRIM PANEL MOUNTED POWER OUTLET

REMOVAL

1- Remove lower seat belt anchor bolt at floor pan.

2- Disconnect D-ring cover from upper seat belt anchor.

3. Remove upper seat belt anchor bolt.



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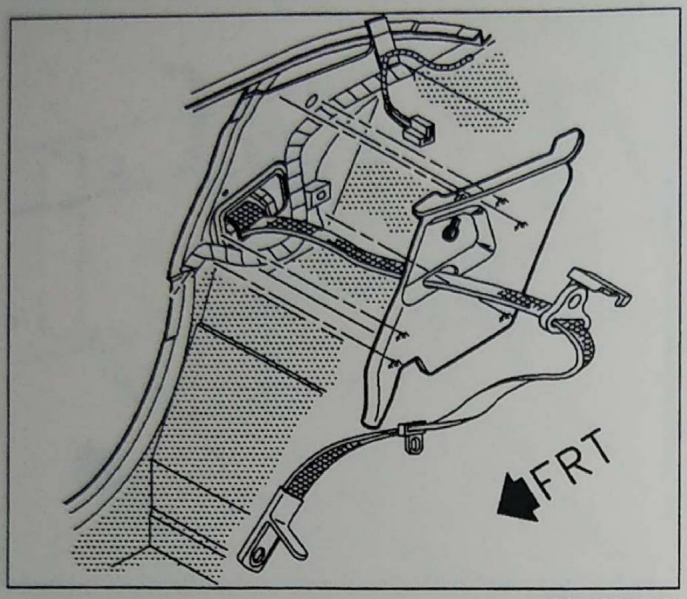
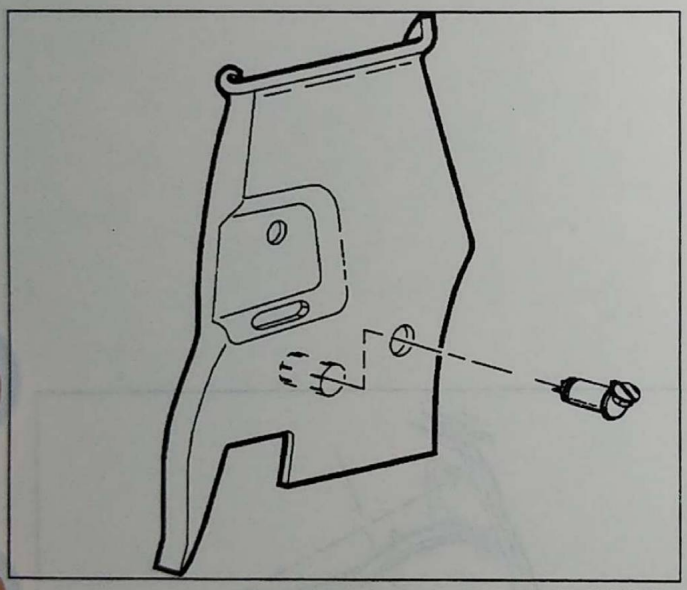


PSMVIS66131AA

4. Starting at bottom of quarter upper trim panel, pull firmly on trim panel at clip locations to release clips.
5. Disconnect wire harness to accessory power outlet plug housing on right side.

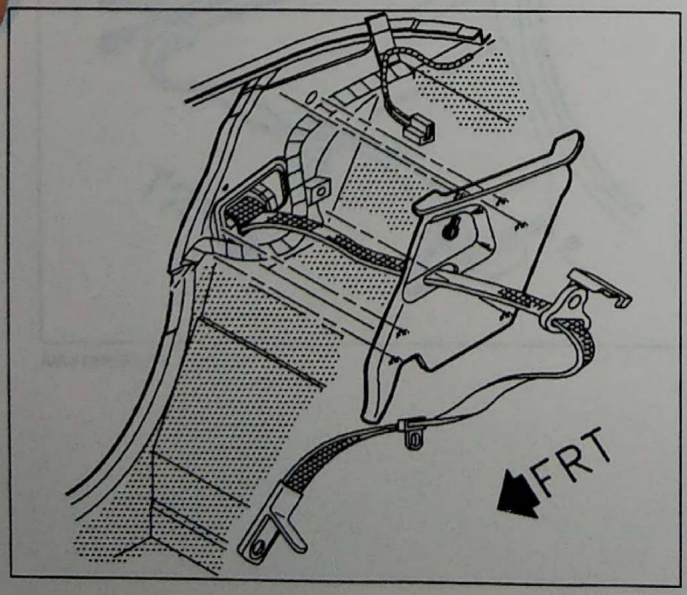


PSMVIS65826AA

6. Remove accessory power outlet housing nut.
7. Remove housing from trim panel.

INSTALLATION

1. Install accessory power outlet housing into right trim panel. Hand tighten housing nut.



PSMVIS66131M

2. Connect wire harness to accessory power outlet plug housing on right hand side.
3. Align clips on trim panel to slots in body and press firmly at clip locations to seat.

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\oHCE-- Use new holt; torque retention of old bolt J„ not be sufficient.

4. position scat belt D. ring to body attachment point and hand start new bolt. After bolt is started *tighten* bolt.

Torque: 41 N*m (30 ft-lbs)

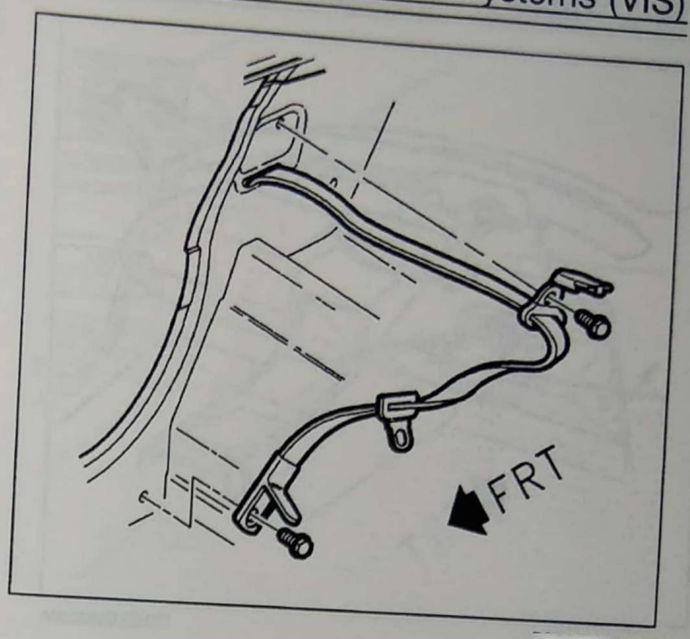
5. Close upper seat belt anchor cover on D-ring

NOTIC E: I se new bolt; torque retention of old bolt may not be sufficient.

6. Position lower seat belt to floor pan attachment point and hand start new bolt. After bolt is started tighten bolt.

Torque: 41 N»m (30 ft-lbs)

7. Check seat belt unit installation for twists and operation of retractor.



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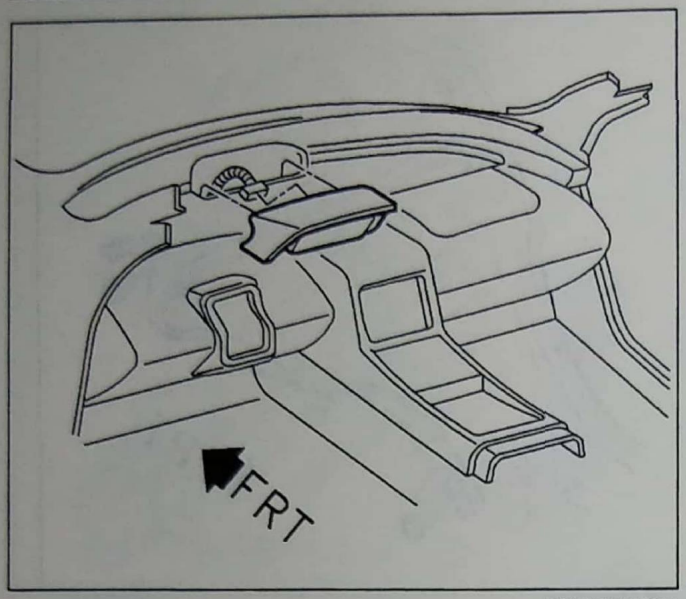
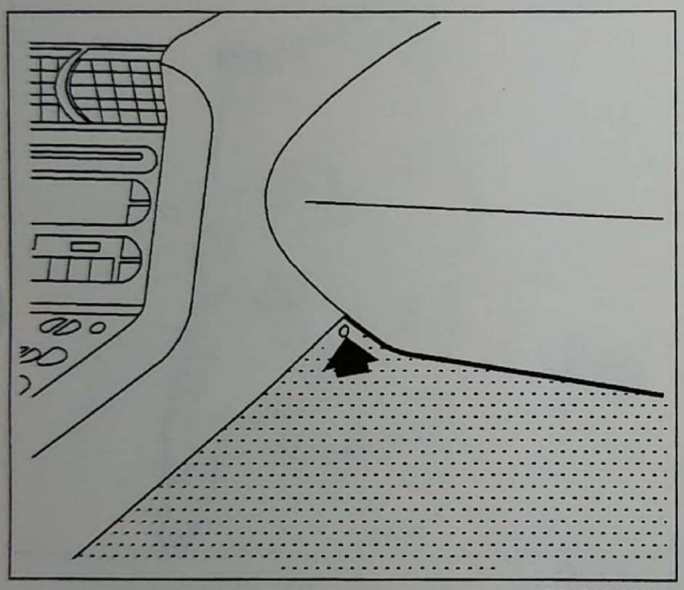
INSTRUMENT PANEL AND CONSOLE



PSMELC66359AA

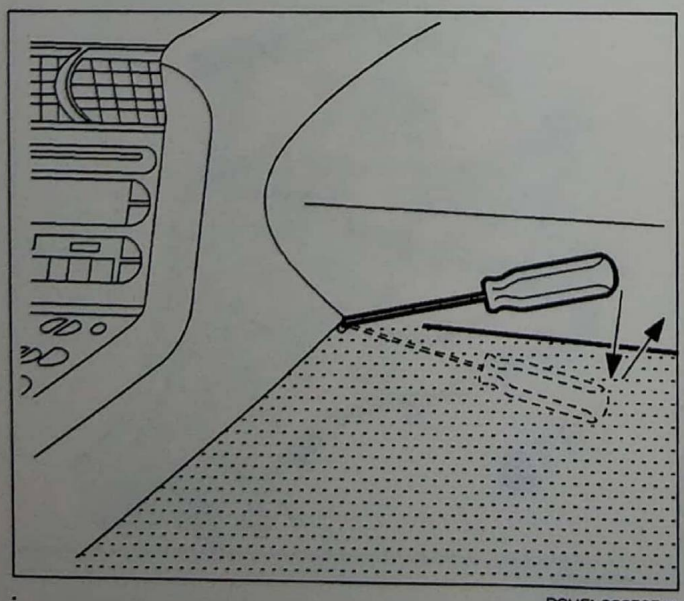
REMOVAL

1. Disable the SIR system. (Refer to “Disabling the SIR System” in this manual.)
2. Remove instrument panel cluster (IPC) by lifting upward and rearward, disconnect the IPC connector.



PSMELC66382AA

3. Locate hole in instrument panel tunnel bracket on right side behind carpet.
4. Use a knife to make a small slit in carpet over the hole.



PSMELC66383AA

5. Insert a screwdriver with a blade about 152—304 mm (6 in.-12 in.) long into the hole in the instrument panel tunnel bracket. Slide screwdriver along instrument panel radio bracket until the screwdriver is wedged between bracket and the radio lock tab. The screwdriver should be inserted about 152 mm (6 in.).

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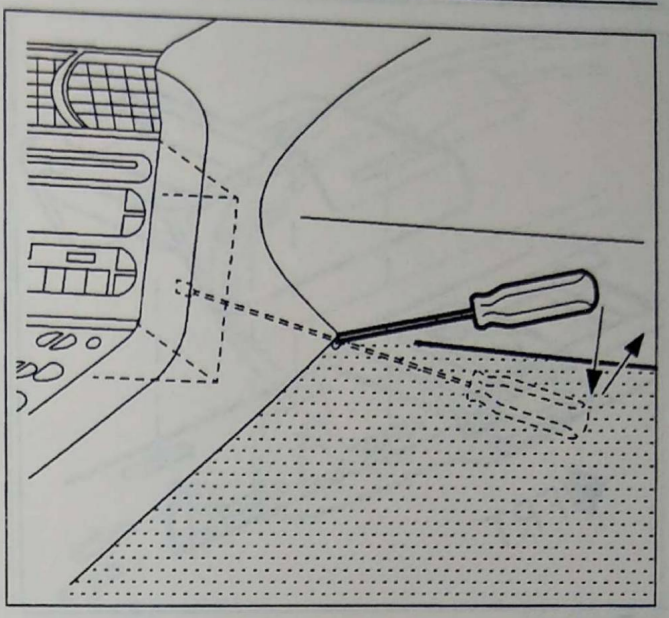
push downward then forward on the screwdriver handle, lifting the lock tab upward and the radio rearward simultaneously. The radio should move rearward enough so that it can be pulled out the rest of the way by hand.

- With the brake applied, shift run/lock shift assembly (RSA) to DRIVE, then select ACCY mode to shut Off power and apply the parking brake to keep the vehicle from rolling unexpectedly.

q Lay a clean shop rag over the RSA to help protect it from getting scratched by the radio case during radio removal.

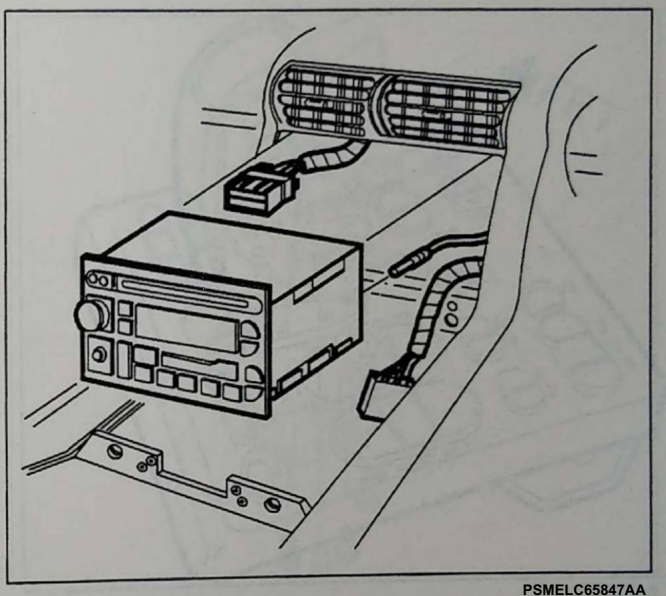
9 Slide radio out of instrument panel.



PSMELC66837M

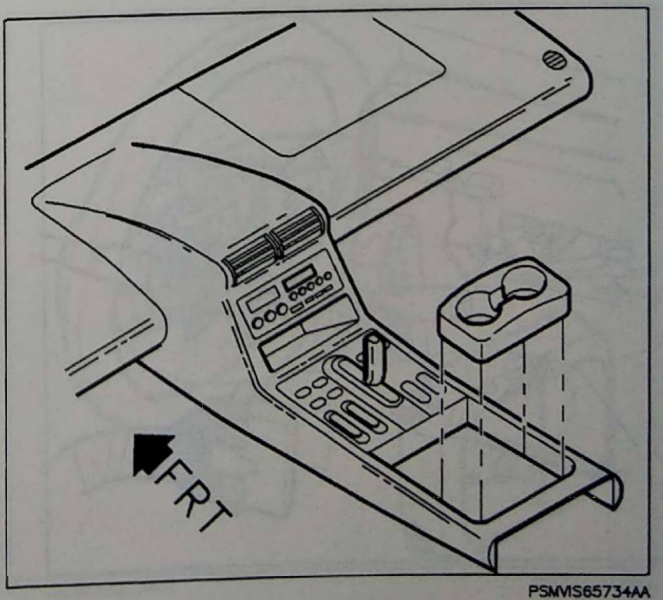
10. Disconnect the antenna lead first, then the harness connector.

11. With the brake applied, select the RUN mode again, and shift back to PARK. Then select the lock mode to turn the vehicle Off.



PSMELC65847AA

12. Remove cup holder.



PSMIS65734AA

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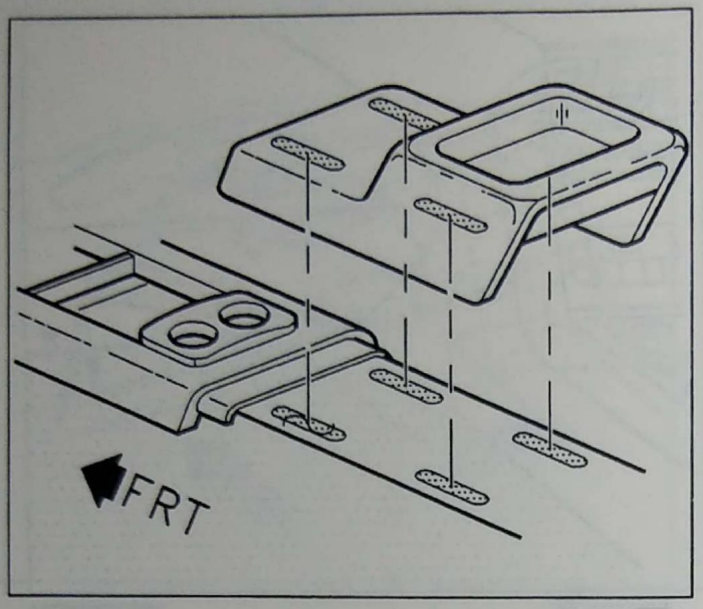
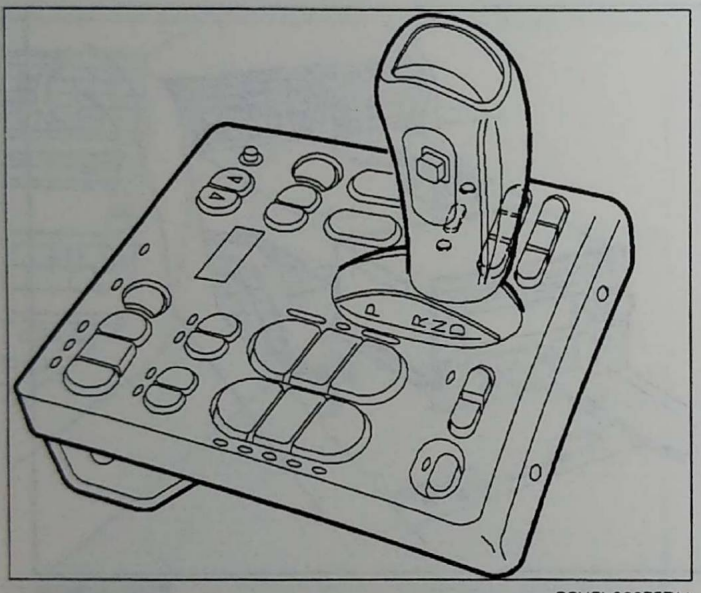


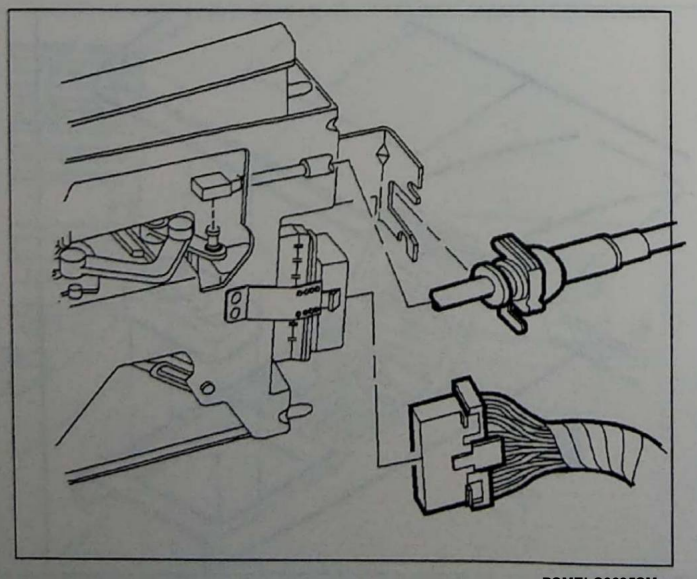
PSMV1S65735AA

13. Remove arm rest from tunnel by lifting upward releasing Dual-Lock retainers.



PSMELC66357AA

14. Remove the screws in the rear of the RSA, pull RSA rearward about 63 mm (2.5 in.).



PSMELC6635SM

15. Rotate RSA towards the drivers side of the vehicle to a 45 degree angle.
16. Disconnect the RSA wire harness connector.
17. Disconnect the shift cable from the shifter and remove shift cable from retainer bracket by prying locking tab on drivers side of RSA gently and pushing cable down out of bracket.

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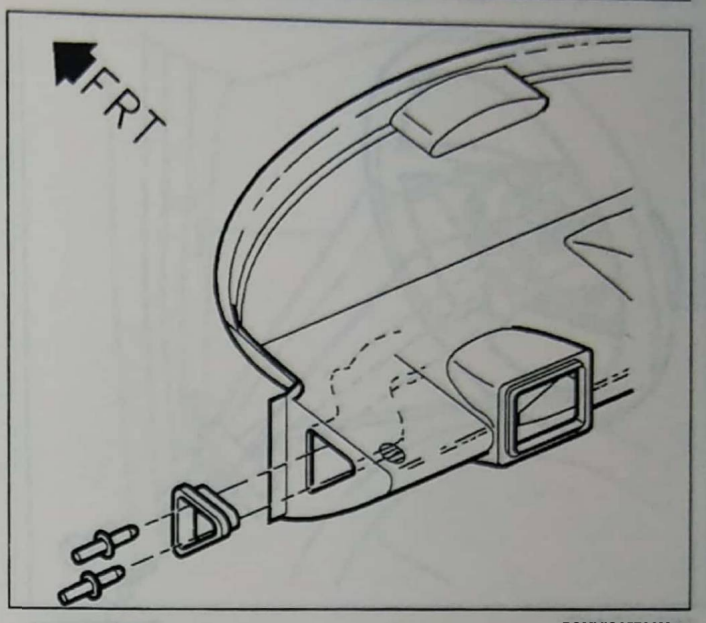
prill out rivets from side door air outlets.

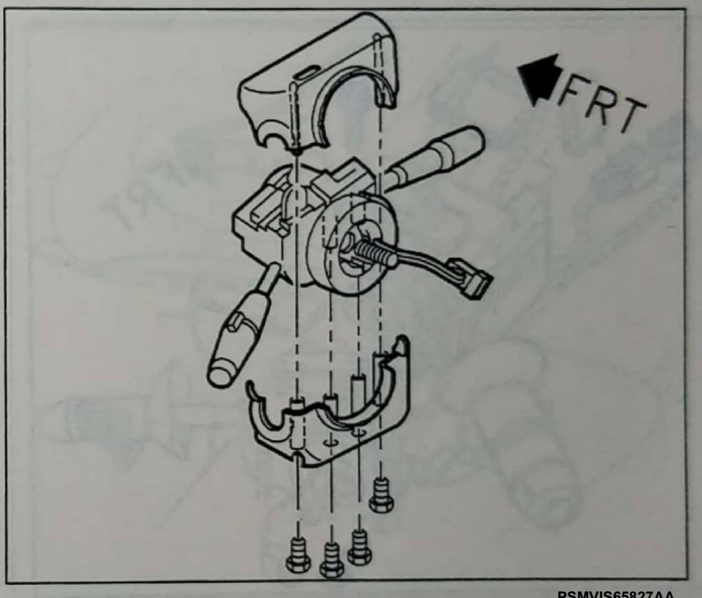
18. Remove left and right front side door air outlets on]?• ı!C side of instrument panel with doors open.



PSMVIS65736M

20. Remove outer screws from lower steering column trim cover, lift upper trim panel off.

21. Remove inner screws from lower steering column trim cover and remove lower trim cover.

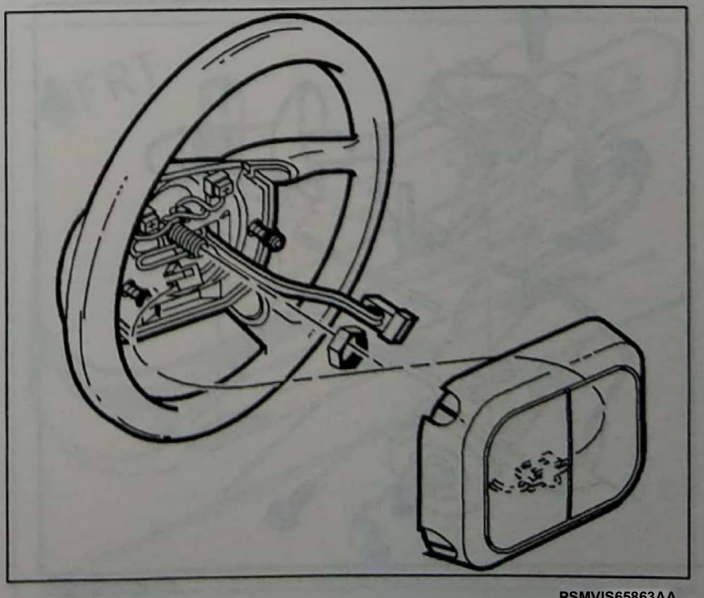


PSMVIS65827AA

22. Remove screws from back of steering wheel that retains SIR inflator module.

23. Remove connector position assurance (CPA) and disconnect inflator module connector.

24. Remove SIR inflator module.



PSMVIS65863AA

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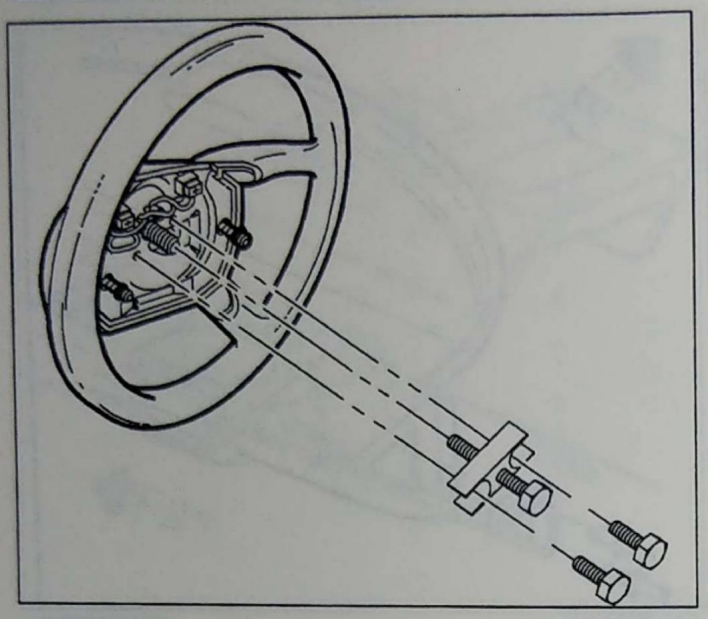
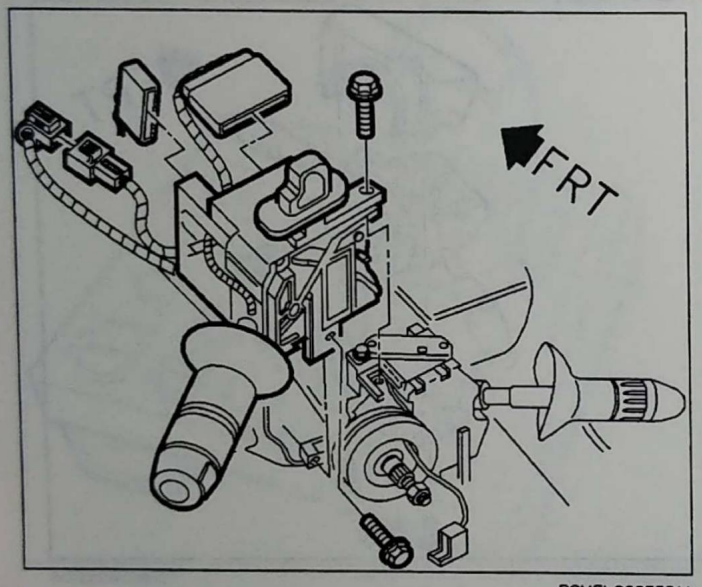


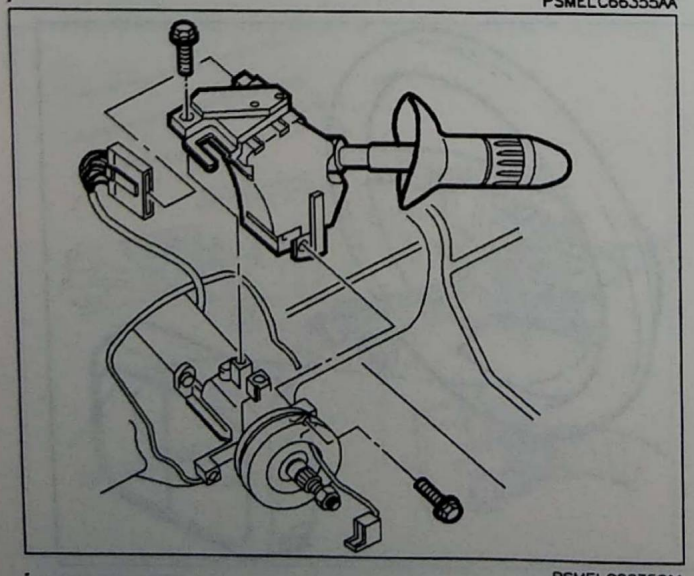
PSMVIS65862M

25. Disconnect horn switch connector.
26. Remove nut from steering column that retains steering wheel.
27. Install steering wheel puller SA9218NE and remove steering wheel.



PSMELC66355AA

28. Remove screws from turn signal, headlamp, and cruise switch.
29. Remove switch and disconnect switch connectors.



PSMELC66356AA

30. Remove screws from windshield washer switch.
31. Disconnect connector and remove switch.

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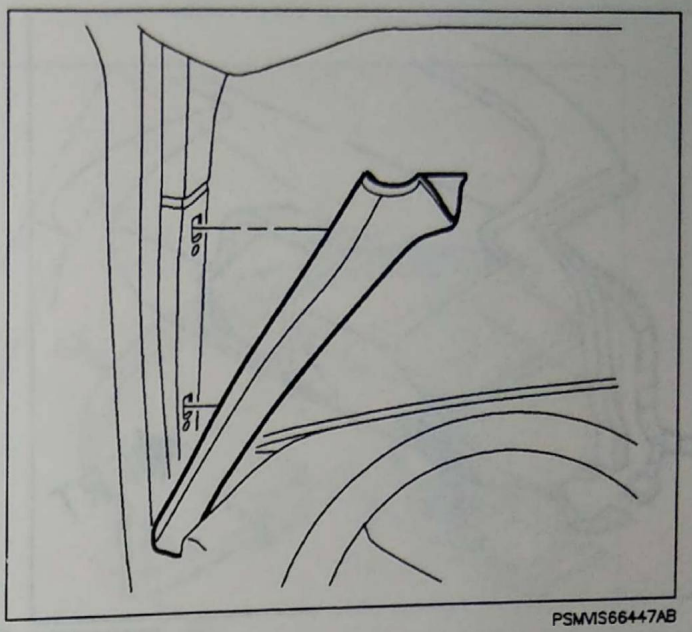
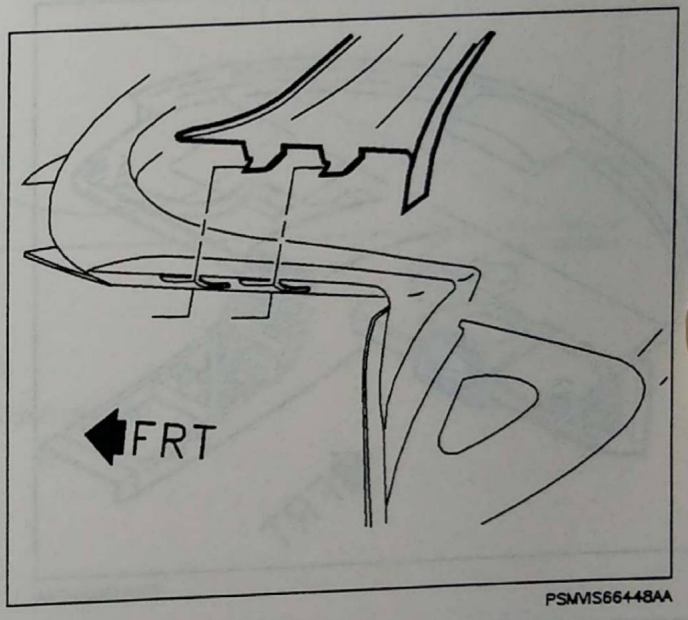
32. Starting at top of garnish molding, pull firmly at clip locations to disengage. Tipping the top of molding inward with the bottom engaged to instrument.



PSMVIS66447AB

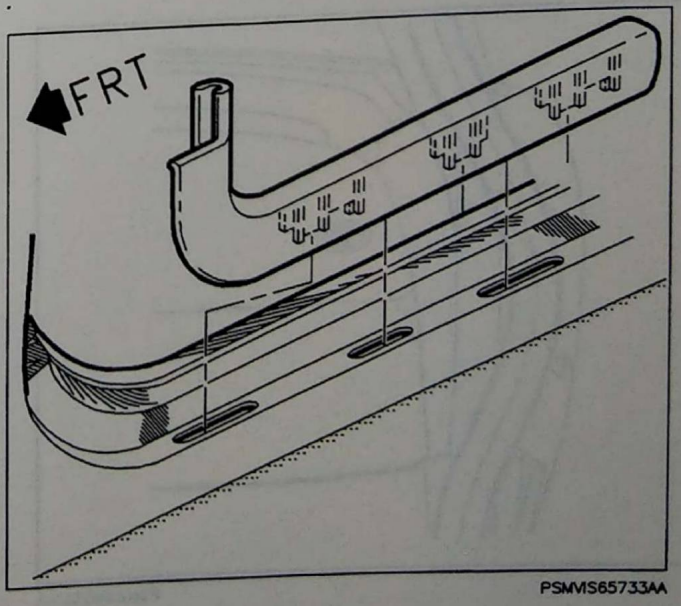
33. Disenaage tabs on garnish molding from instrument panel by]pulling rearward and inboard.



PSMVIS66448AA

34. Starting at rear of carpet retainer, pull firmly on carpet retainer at clip locations to disengage c ips.

35. Remove front side door opening floor carpet retainer.



PSMVIS65733AA

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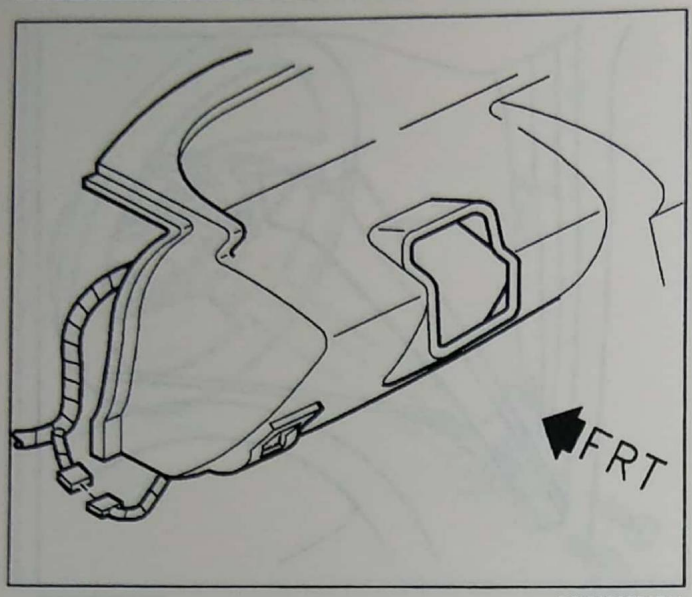
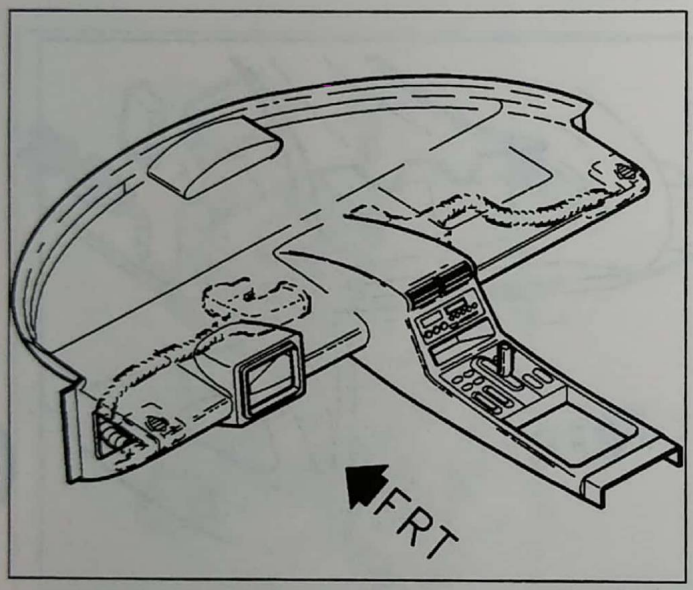


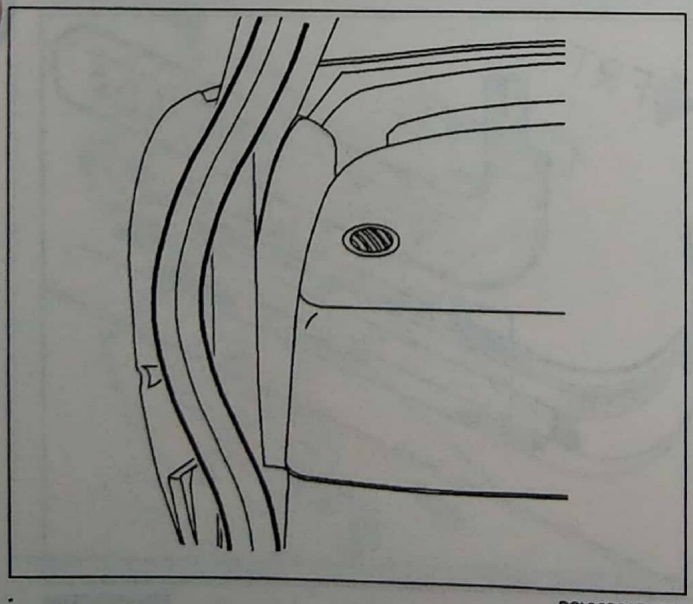
PSMV1S65865AA

36. Disconnect parking brake switch connector



PSMVIS66047AA

37. Disconnect side window demistor tubes from floor outlets.



PSMVIS66337AA

38. Remove side door weatherstrip from pinch weld flange near instrument panel.

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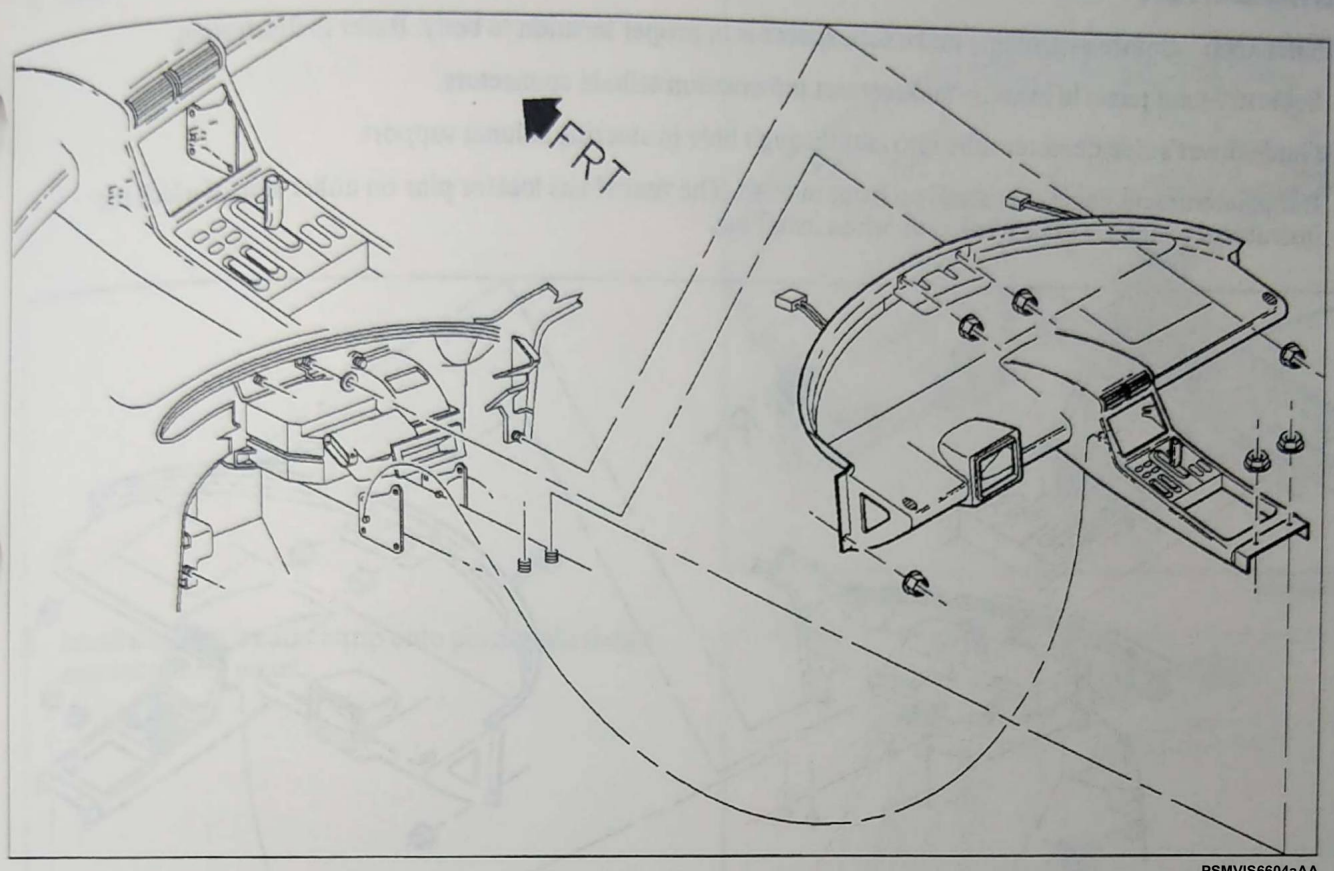

PSMVIS6604aAA

39. Remove retainers from instrument panel.
40. Pull instrument panel rearward with slight upward pressure.
41. Pull driver's side demister tube through hole in steering column support
42. Disconnect both information telltale connectors.
43. Remove instrument panel from vehicle.

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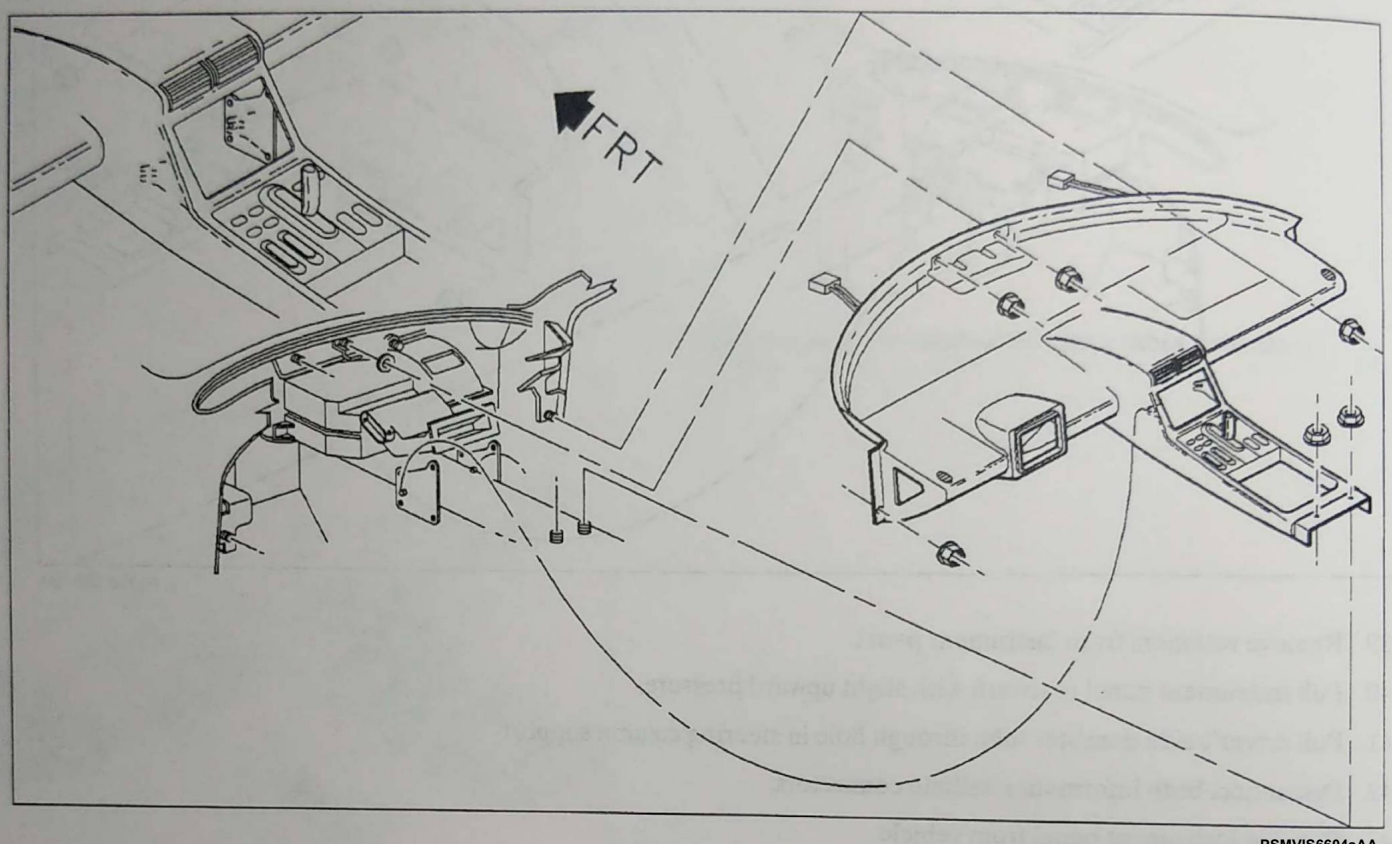
INSTALLATION

IMPORTANT: Before assembling make sure spacer is in proper location to body. Refer to illustration.

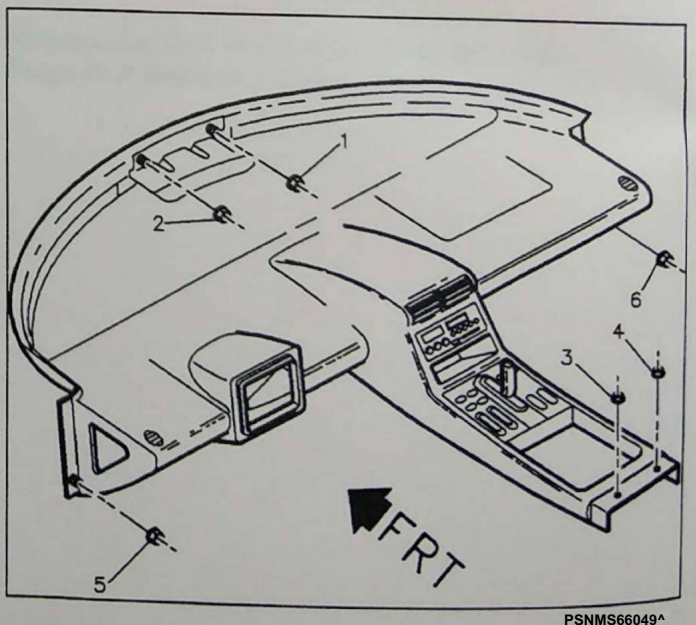
1. Set instrument panel in location and connect information telltale connectors.
2. Guide driver's side demister tube into and through hole in steering column support.
3. Install instrument panel over studs on front of dash. The tunnel has locator pins on either side of which the instrument panel has to be located on when installing.



PSMVIS6604aAA

4. Secure instrument panel fasteners. Torque in sequence shown.

Torque: 5 N*m (44 in—lbs)



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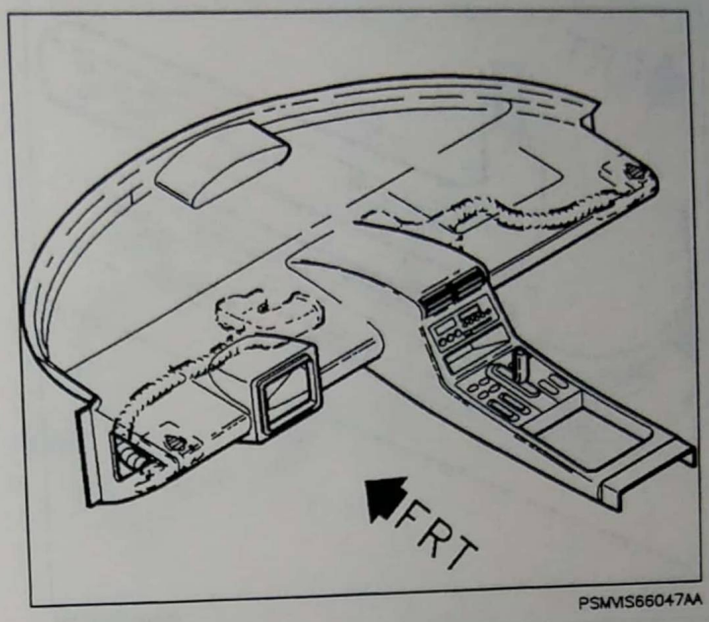
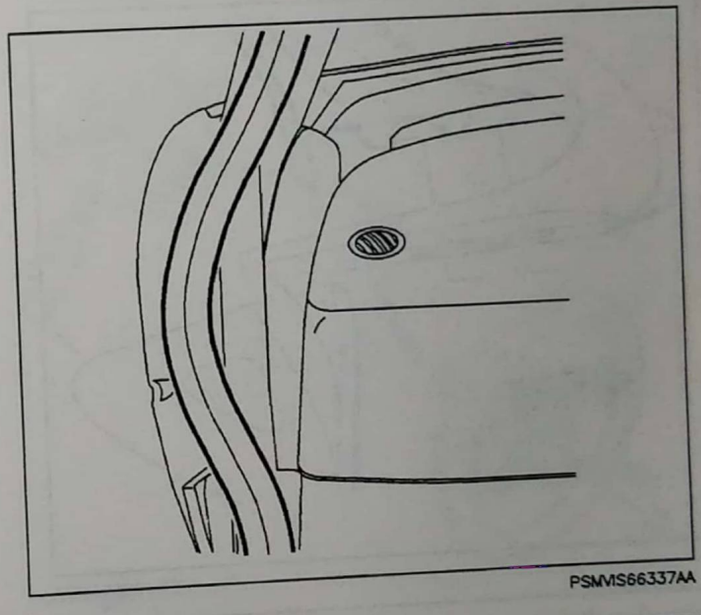
5. Connect side window demister tubes to floor outlets.



PSMIS66047AA

6. Install side door weatherstrip onto pinch weld flange near instrument panel.


PSMIS66337AA

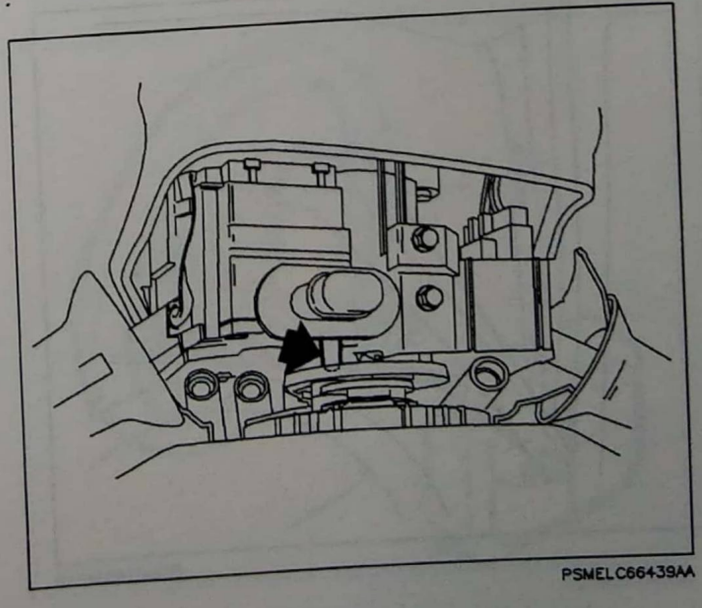
7. Connect connector to windshield washer s witch.
8. Install screws retaining switch.

Torque: 2.5 N*m (22 in-lbs)

9. Connect connectors to turn signal, headlamp, and cruise switch.
10. Place switch in position, being careful that P f the in is positioned correctly against the ring on the back the turn signal cancel cam assembly.
11- Install screws retaining switch.

Torque: 2.5 N«m (22 in-lbs)

N


PSMELC66439AA

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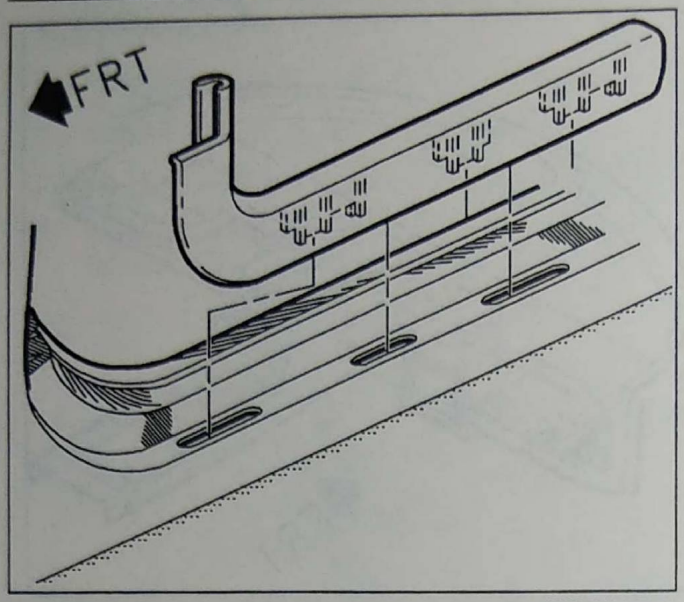
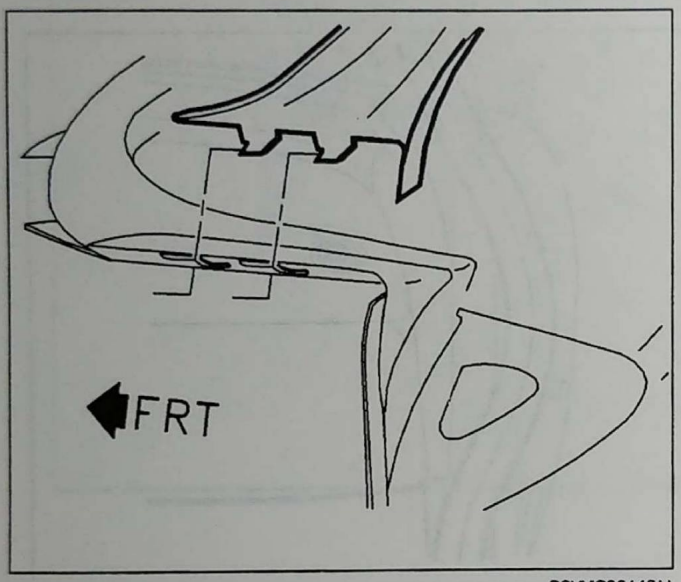


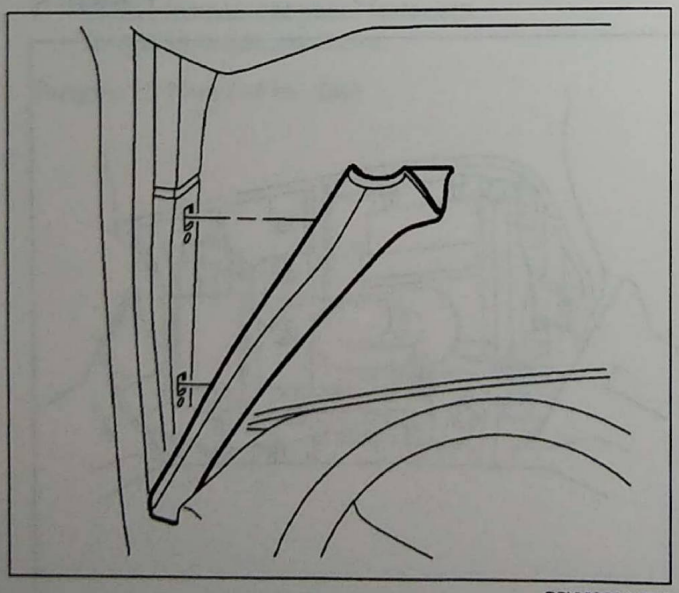
PSMVIS65733AA

12. Locate carpet retainer to door opening.
13. Firmly seat carpet retainer into weather.
14. Snap clips into slots in inner rocker pan.



PSMVIS66448AA

15. Insert tabs on bottom of garnish molding into instrument panel.
16. Push molding downward and forward past A-pillar structure.



PSMVIS66447AB

17. Push molding to structure pressing forward and outward to insure proper fit to instrument panel, headlining and door seal.
18. Align clips on garnish molding to slots in A-pillar and press firmly at clip locations.
19. Position flap on door weatherstrip over windshield garnish molding.

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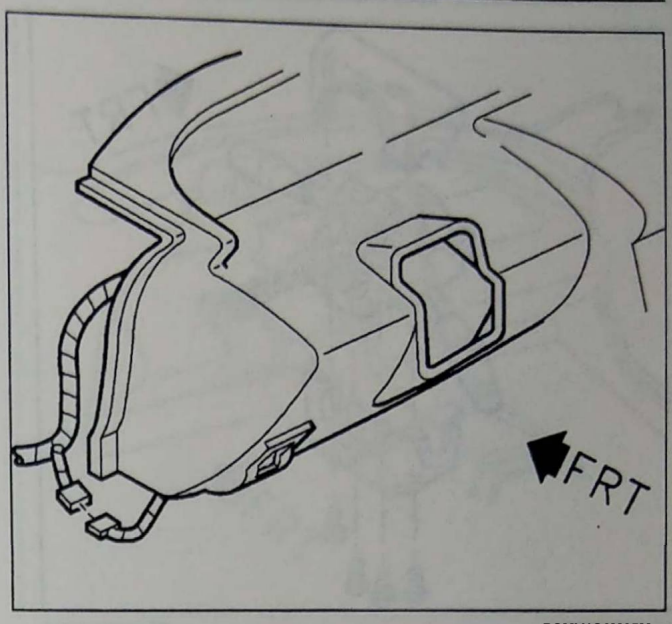
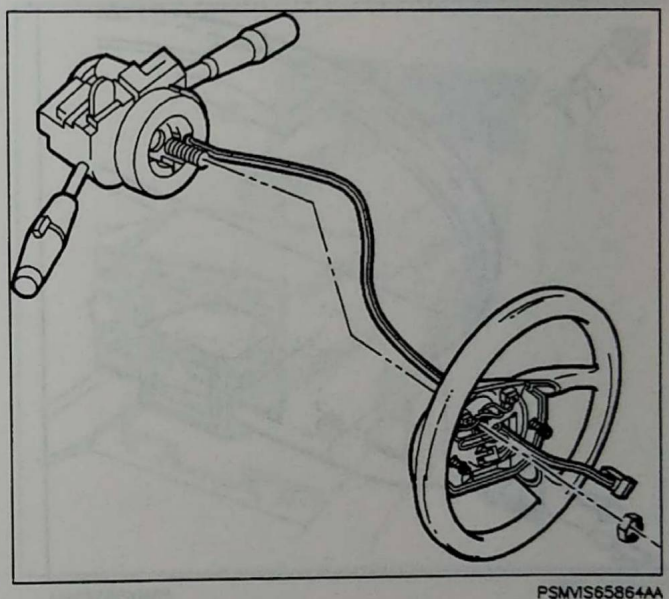
20. Connect park brake switch connector.



PSMV1S6M65M

21. Route SIR cable through steering wheel. Install steering wheel to column.
22. Connect horn wire connector.
23. Install steering wheel nut.

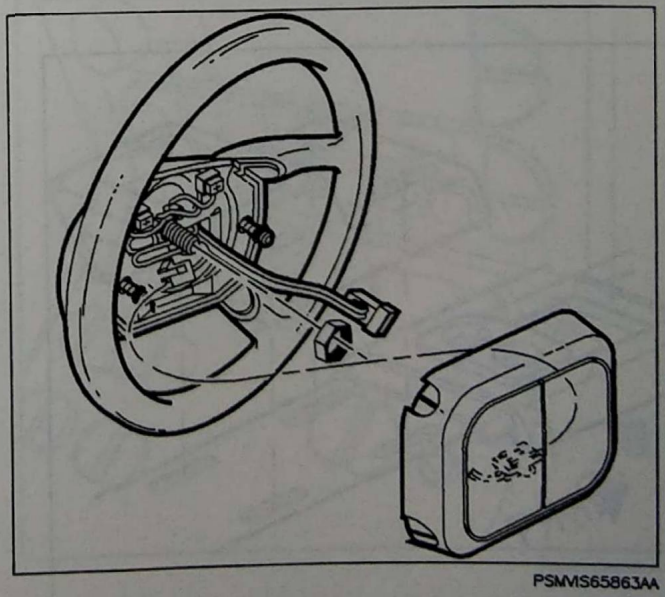
Torque: 42 N*m (31 ft-lbs)



PSMVIS65864AA

24. Route yellow SIR inflator module wire harness within the steering wheel hub forming an "S" shape with wire and connect SIR inflator module connector.
25. Install CPA. to connector.
26. install inflator module to steering wheel.

Torque: **10 N»m (89 in—lbs)**



PSMVIS65863AA

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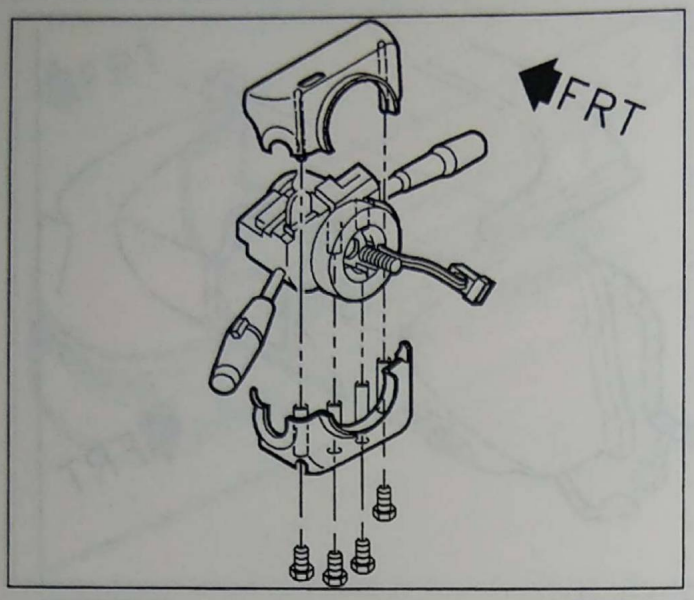
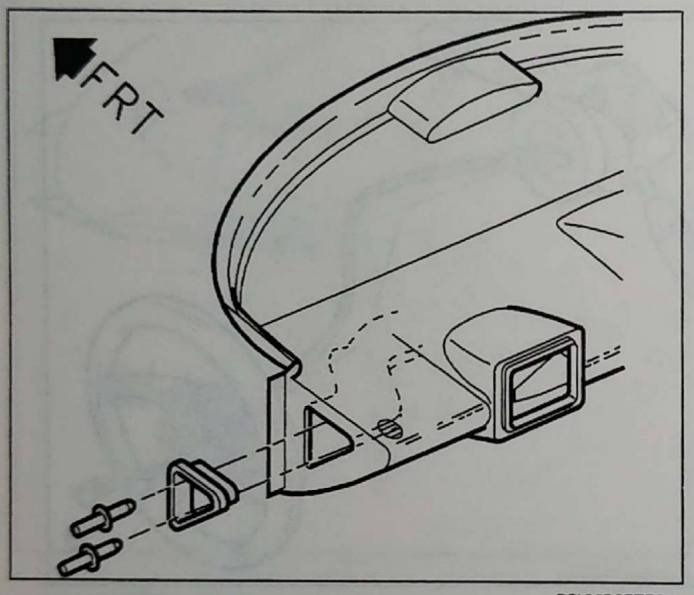


PSMV1S65827AA

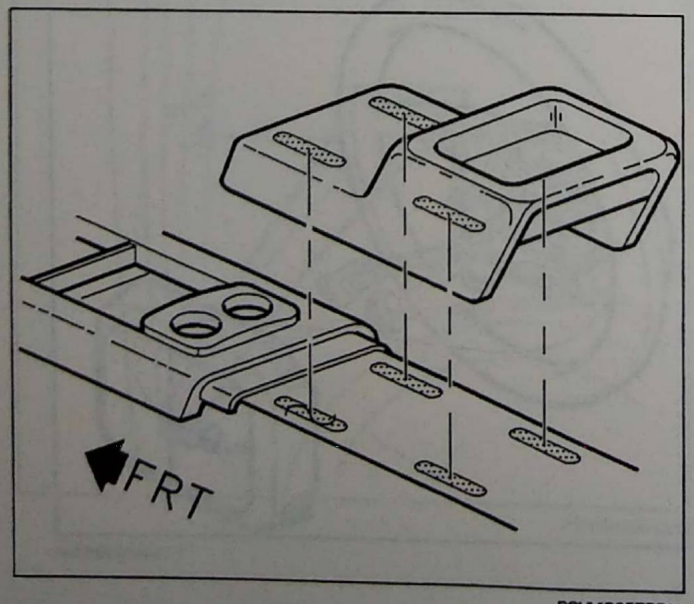
27. Align lower steering column trim cover to steering column. Install and tighten inner screws.

28. Align upper steering column trim panel to steering column and install outer screws in lower steering & column trim panel. Tighten outer screws.



PSMV1S65736AA

29. Install left and right front side door air outlets on side of the instrument panel using new fasteners.



PSMV1S65735AA

30. Install arm rest

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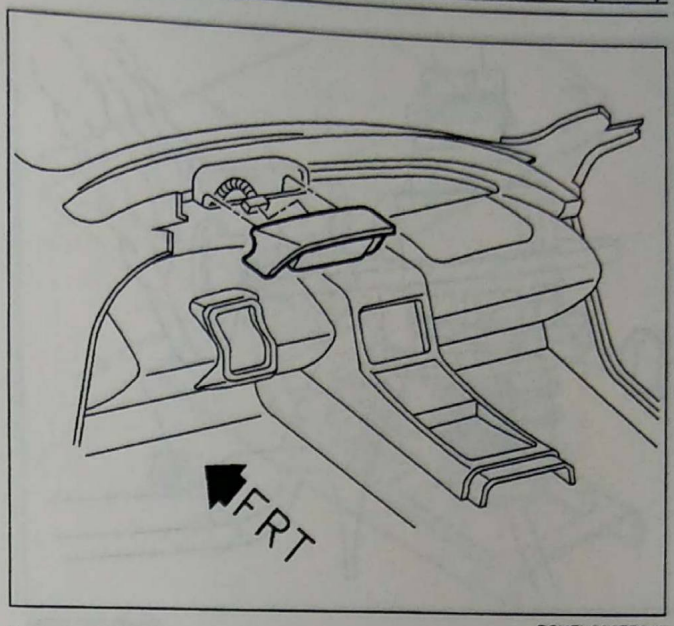
push harness connector into socket on instrument panel cluster. Verify connection is made, seated and locked.

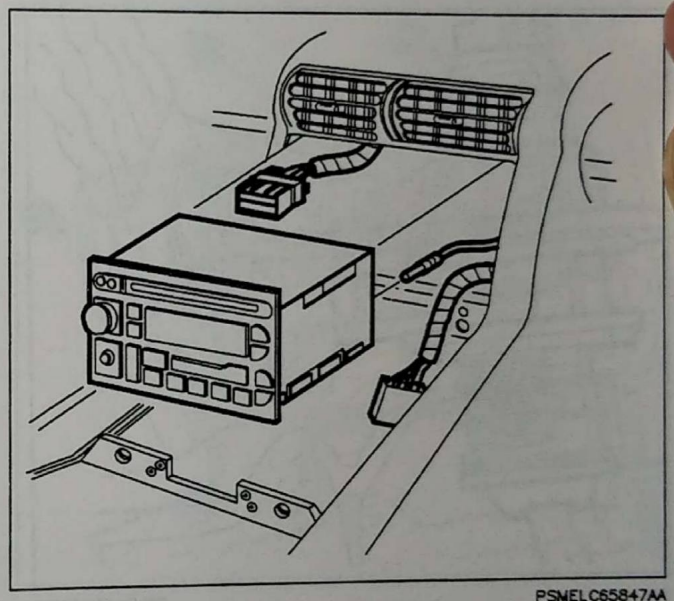
32. Install instrument panel cluster into instrument panel by pushing forward and downward.



PSMELC66359AA

33. Connect radio harness to radio, then antenna lead to radio. Verify both connections are seated properly.

34. Make sure antenna and harness are up and out of the way of the radio bracket. Slide radio into opening until the radio is seated and the radio fits tightly to the console. You may hear a click as the radio tab locks into the bracket.


PSMELC65847AA

35. Cover the radio face with a rag for protection during RSA installation. Install shift cable housing into shift bracket and connect and secure shift cable to shifter. Be sure dip lock tab is in place.

36. Connect wire harness connector to RSA.

37. Align RSA locator tabs to front of instrument panel and push down on the rear of the RSA.

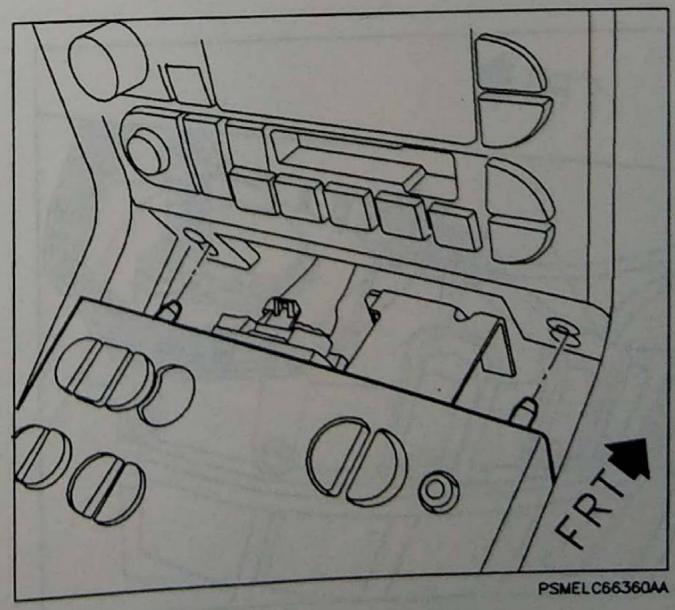
38. Install fasteners.

Torque: 6 Nm (53 in-lbs)

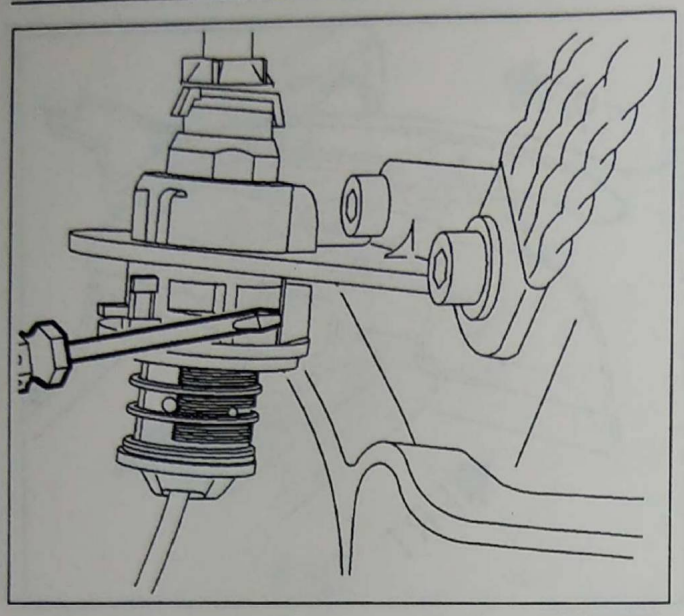
ORIANT: You must adjust shift cable at final drive

39. Adjust shift cable:

IMPORTANT: The shift cable must be attached to the RSA with the RSA secured in position. Shift handle must be Placed in neutral before cable adjustment is formed



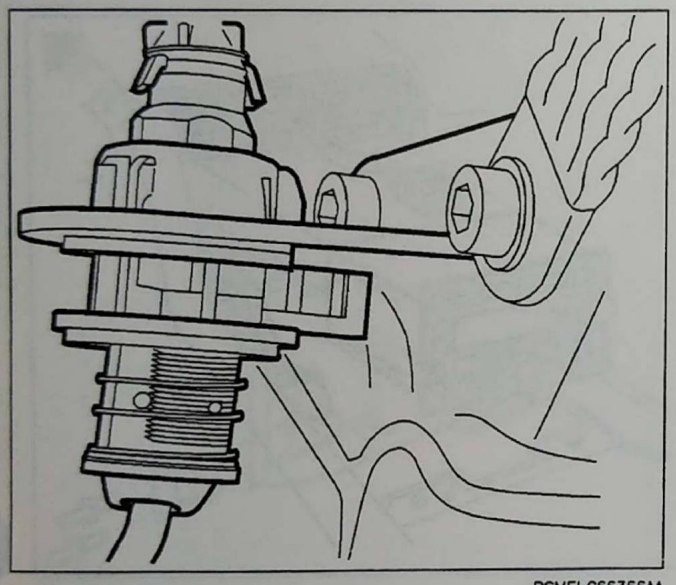
PSMELC66360AA



PSMELC66365AA

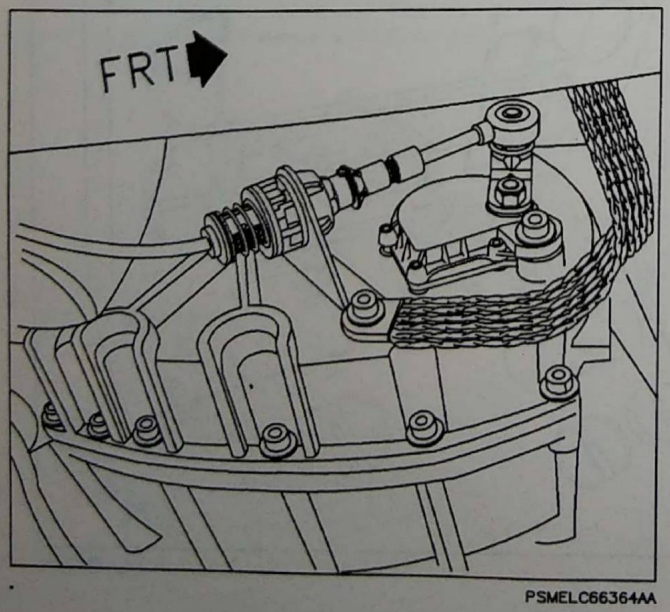
a. Remove underbody front air deflector assembly (Refer to "Underbody Front Air Deflector Assembly" in this manual.)

b. Unlock U-shaped adjustment collar. Collar is located aft of drive unit bracket, and will unlock by inserting a pocket screwdriver into gap and prying towards drive unit.



PSMELC66366AA

IMPORTANT: About 13 mm (1/2 in.) movement necessary to insure unlock position.



PSMELC66364AA

c. Verify shift lever is in neutral. Push U-shaped collar into lock position. Collar will move to right side of vehicle.

d. By hand shift park/lock lever to the full counterclockwise position (DRIVE) then move one detent in the clockwise direction (NEUTRAL).

e. Install underbody front air deflector assembly. (Refer to "Underbody Front Air Deflector Assembly" in this manual.)

NOTICE: If shift cable has been removed more than six times at either end, for any reason, the cable must be replaced.

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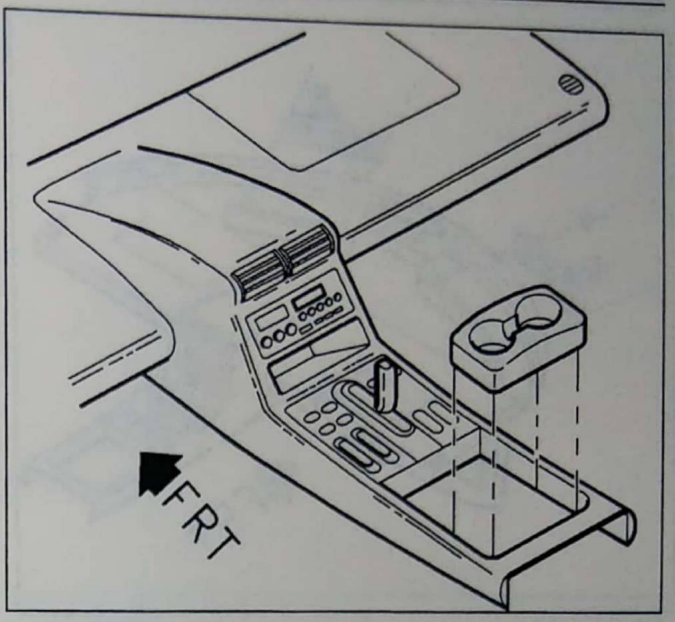
40. Install cup holder to center console.
41. Enable the SIR system. (Refer to "Enabling the SIR System" in this manual.)



PSMIS65734AA

INSTRUMENT PANEL CENTER AIR OUTLET

REMOVAL

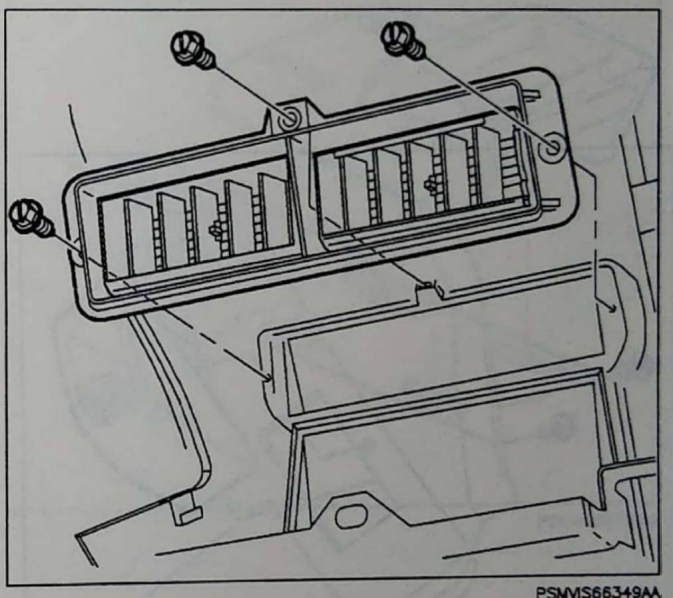
1. Remove instrument panel from vehicle. (Refer to "Instrument Panel" removal procedure in this manual.)
2. Remove center air outlet screws from the back of instrument panel and remove from instrument panel.

INSTALLATION

1- Install center air outlet into instrument panel.

2- Install and tighten center air outlet screws.

3- Install instrument panel. (Refer to "Instrument Panel installation procedure in this manual.)



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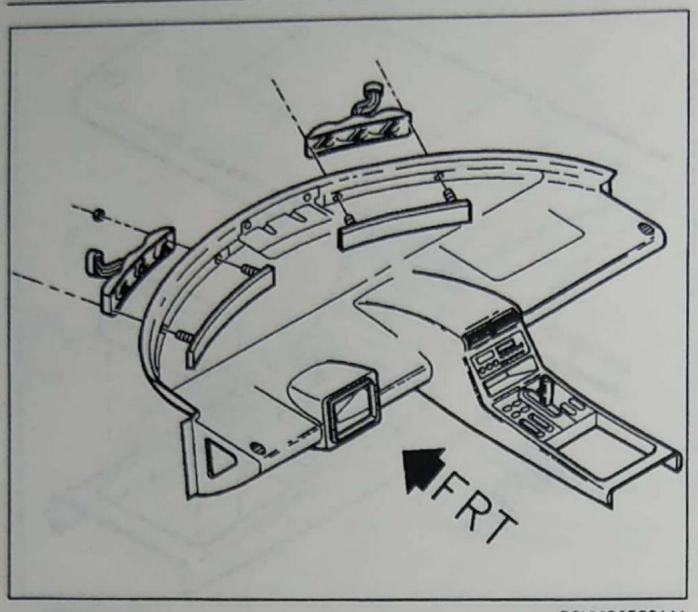


PSMVIS65821AA

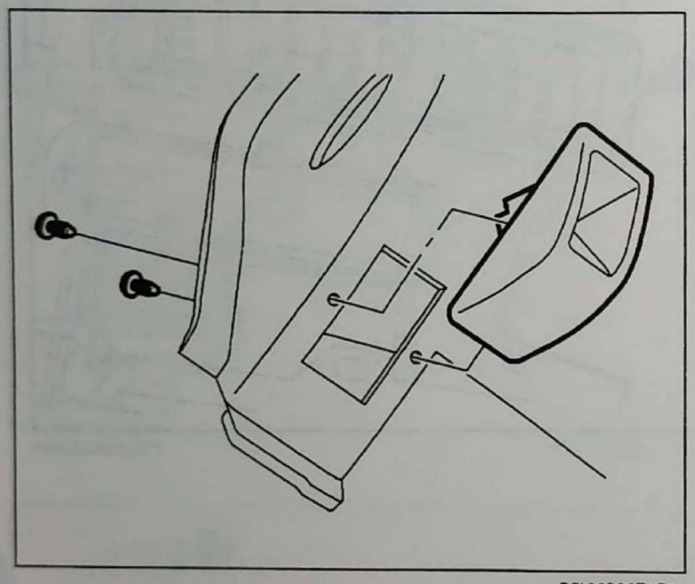
INFORMATION TELLTALES/LENS

REMOVAL

1. Remove instrument panel from vehicle. (Refer to "Instrument Panel" removal procedure in this manual.)
2. Remove information telltale nuts.
3. Remove information telltales from telltale lens studs and remove from instrument panel.
4. Remove information telltale lens from instrument panel.

INSTALLATION

1. Install information telltale lens into instrument panel.
2. Install information telltale onto telltale lens studs.
3. Install and tighten telltale nuts.
4. Install instrument panel. (Refer to "Instrument Panel" installation procedure in this manual.)



PSMVIS66747AA

PARK BRAKE SWITCH TRIM PLATE

REMOVAL

1. Disconnect park brake switch connector.
2. Remove park brake switch from instrument panel.
3. Remove park brake switch trim plate screws from the back side of instrument panel.

INSTALLATION

1. Align park brake trim plate to instrument panel and install and tighten screws.
2. Install park brake switch into instrument panel.
3. Connect park brake switch connector.

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SIDE WINDOW DEMISTER DUCT

IMPORTANT: If side window demister duct is damaged when removing from floor duct use the following procedure to install a new side window demister duct. If the side window demister duct is pulled loose from instrument panel or the foam block on instrument panel is damaged the instrument panel will need to be replaced.

REMOVAL

Unscrew demister duct from foam block on instrument panel

INSTALLATION

Insert new demister duct in foam block.

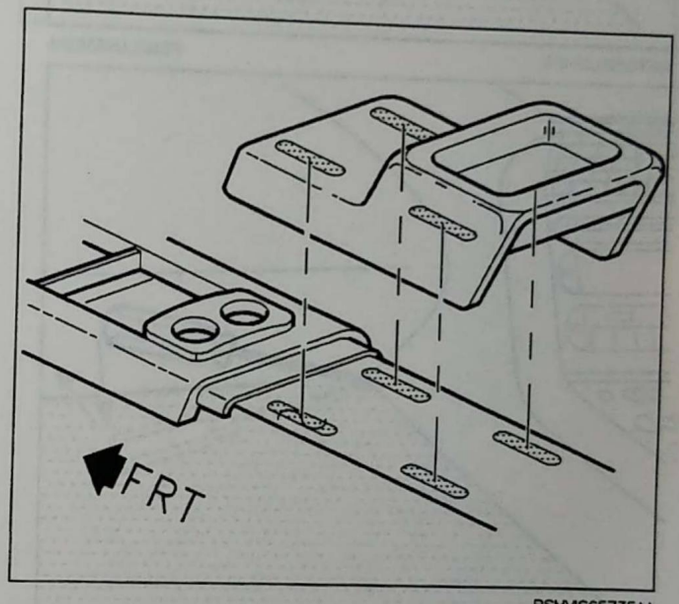
CONSOLE ARMREST

REMOVAL

Armrest is retained with Dual-Lock retainers. To remove armrest lift upward to release Dual-Lock retainers.

INSTALLATION

Align armrest with front console to minimize gap. Press armrest into place securing Dual-Lock retainers.



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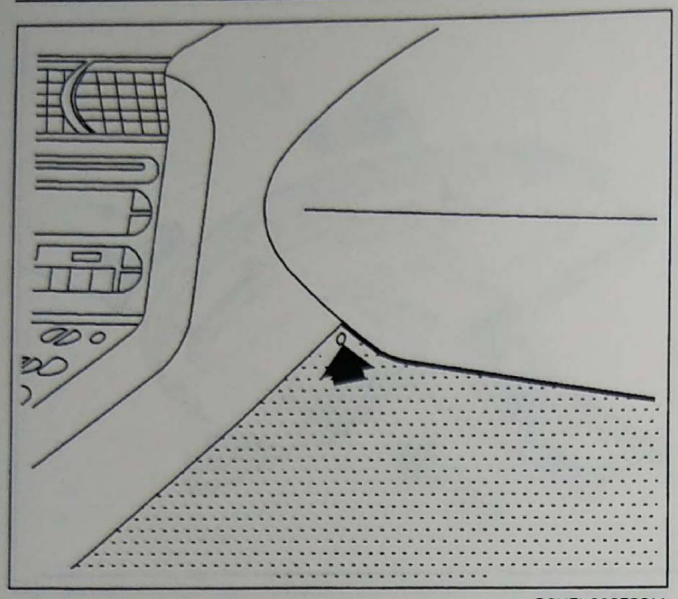
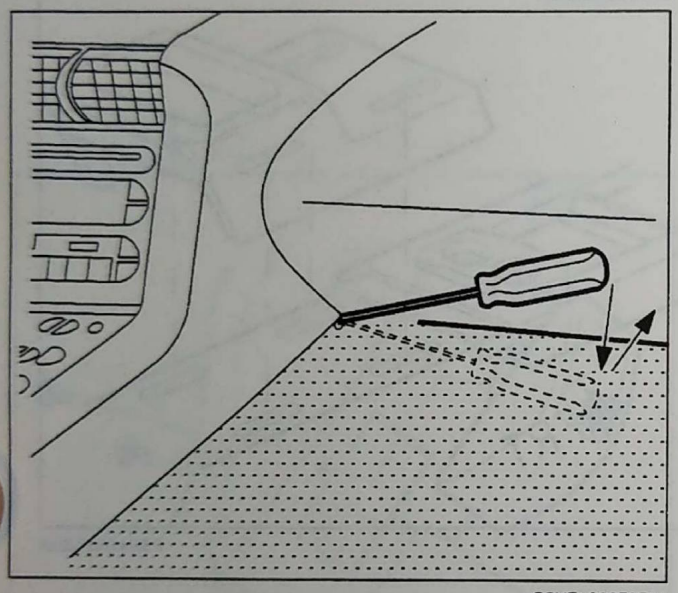
AUDIO SYSTEM

RADIO REMOVAL



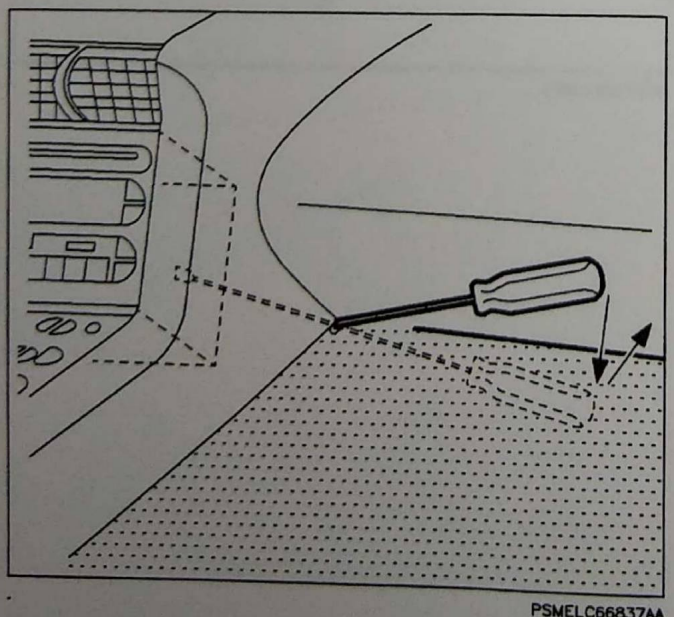
PSMELC66382AA

1. If radio is being replaced and presets are still functional, record preset radio stations and tone setting for each station before power is disconnected. (There are ten FM and five AM presets.)
2. Locate hole in instrument panel tunnel bracket on right side behind carpet.
3. Use a knife to make a small slit in carpet over the hole.



PSMELC66383AA

4. Insert a screwdriver with a blade about 152-304 mm (6 in.-12 in.) long into the hole in the instrument panel tunnel bracket. Slide screwdriver along instrument panel radio bracket until the screwdriver is wedged between bracket and the radio lock tab. The screwdriver should be inserted about 152 mm (6 in.).



PSMELC66837AA

5. Push downward then forward on the screwdriver handle, lifting the lock tab upward and the radio rearward simultaneously. The radio should move rearward enough so that it can be pulled out the rest of the way by hand.
6. With the brake applied, shift run/lock shift assembly (RSA) to DRIVE, then select ACCY mode to shut Off power and apply the parking brake to keep the vehicle from rolling unexpectedly.
7. Lay a clean shop rag over the RSA to help protect it from getting scratched by the radio case during radio removal.
8. Slide radio out of instrument panel.

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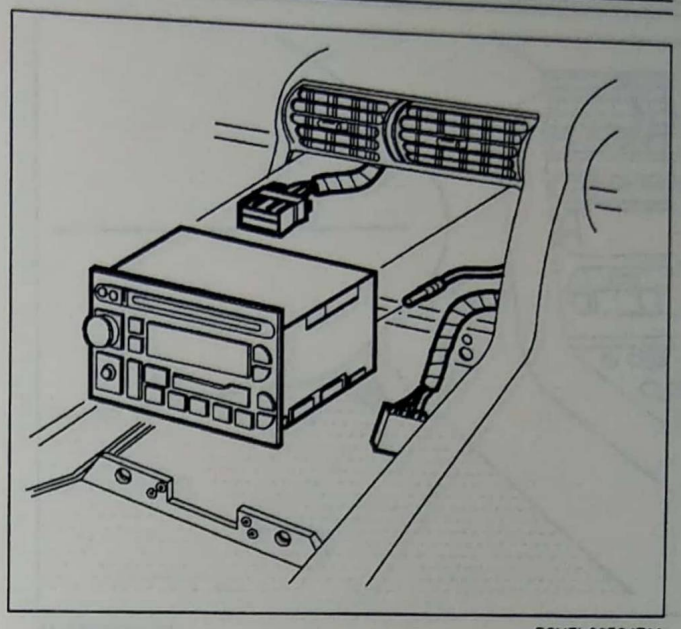
•""L. mnnect the antenna lead first, then the harness
9. connector.

with the brake applied, select the RUN mode again,
10 i chift back to PARK. Then select the lock mode
tZ'rn the vehicle Off.



PSMELC65847AA

RADIO INSTALLATION

1. Put the vehicle in RUN mode and shift to DRIVE, then select ACCY mode while in DRIVE.
2. Make sure the RSA is still protected with a clean shop rag over it. Connect radio harness to radio, then antenna lead to radio. Verify both connections are seated properly.
3. Make sure antenna and harness are up and out of the way of the radio bracket. Slide radio into opening until the radio is seated and the radio fits tightly to the console. You may hear a click as the radio tab locks into the bracket.
4. With the service brake applied, select RUN mode again and shift to PARK.
5. Reset radio presets and tone settings if new radio was installed and they were recorded in step 1 of removal procedure.

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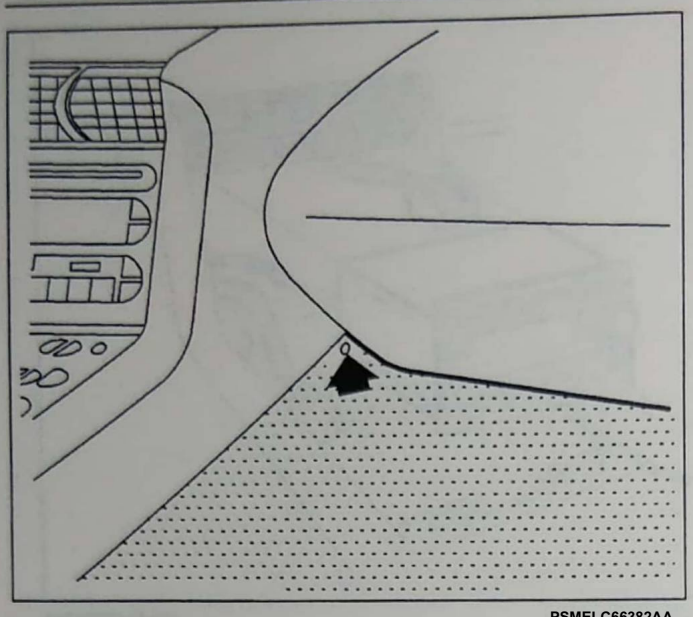
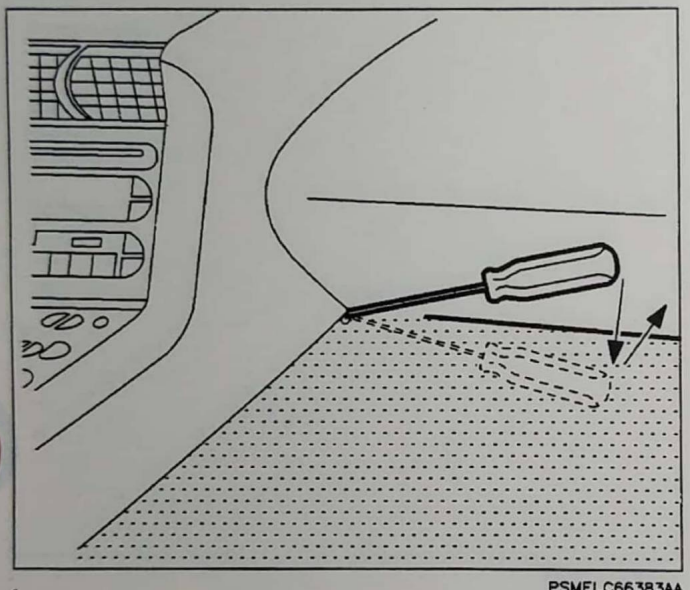
ANTENNA LEAD

REMOVAL



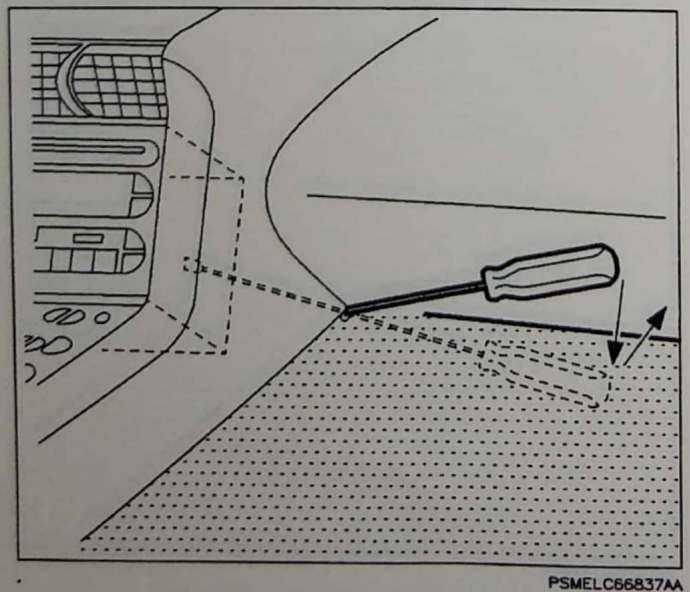
PSMELC66382AA

1. Locate hole in instrument panel tunnel bracket on right side behind carpet.
2. Use a knife to make a small slit in carpet over the hole.



PSMELC66383AA

3. Insert a screwdriver with a blade about 152-304 mm (6 in. —12 in.) long into the hole in the instrument panel tunnel bracket. Slide screwdriver along instrument panel radio bracket until the screwdriver is wedged between bracket and the radio lock tab. The screwdriver should be inserted about 152 mm (6 in.).



PSMELC66837AA

4. Push downward then forward on the screwdriver handle, lifting the lock tab upward and the radio rearward simultaneously. The radio should move rearward enough so that it can be pulled out the rest of the way by hand.
5. With the brake applied, shift run/lock shift assembly (RSA) to DRIVE, then select ACCY mode to shut Off power and apply the parking brake to keep the vehicle from rolling unexpectedly.
6. Lay a clean shop rag over the RSA to help protect it from getting scratched by the radio case during radio removal.
7. Slide radio out of instrument panel.

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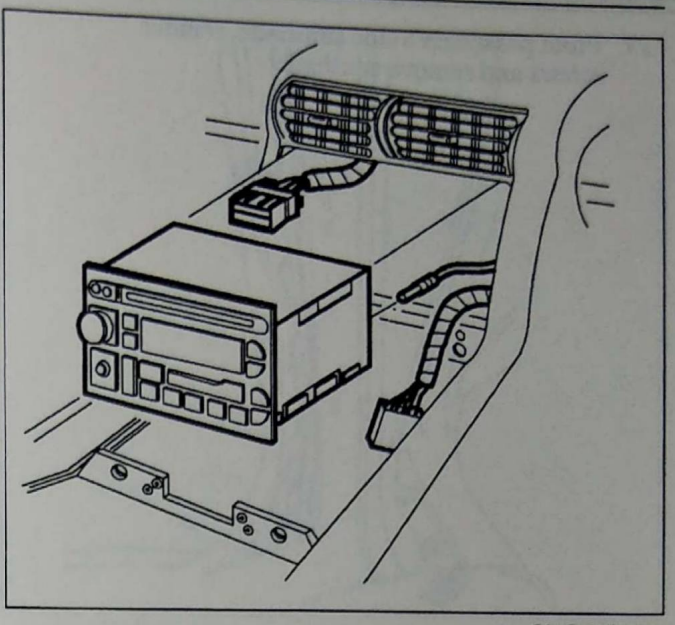
8. pjseonnect the antenna lead first, then the harness c0nnector'

9. With the brake applied, select the RUN mode again, and shift back to PARK. Then select the lock mode to turn the vehicle Off.

10. Pull down passenger side carpet and pull radio lead past of radio cavity area.

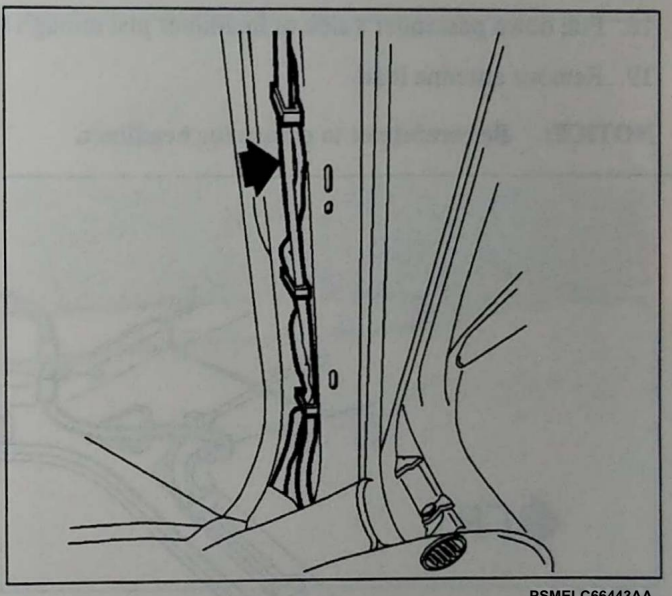
11. Disconnect antenna lead clip from harness.



PSMELC65847AA

12. Remove windshield garnish molding. (Refer to "Windshield Garnish Molding" removal found in this manual.)

13. Remove passenger side seatbelt D-Ring bolt.

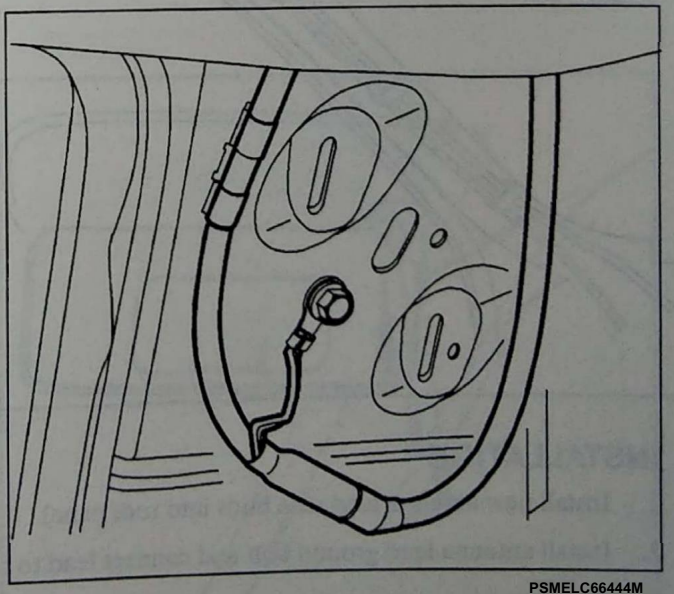


PSMELC66443AA

14. Pull back passenger side quarter upper trim panel to gain access to antenna lead ground bolt.

15. Remove antenna lead 10 mm ground bolt from 9tiarter upper trim panel

16. disconnect antenna lead from antenna.



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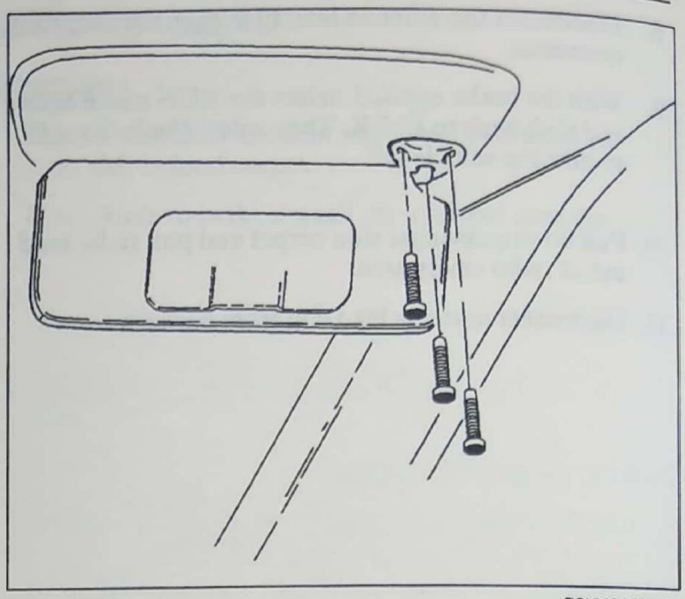
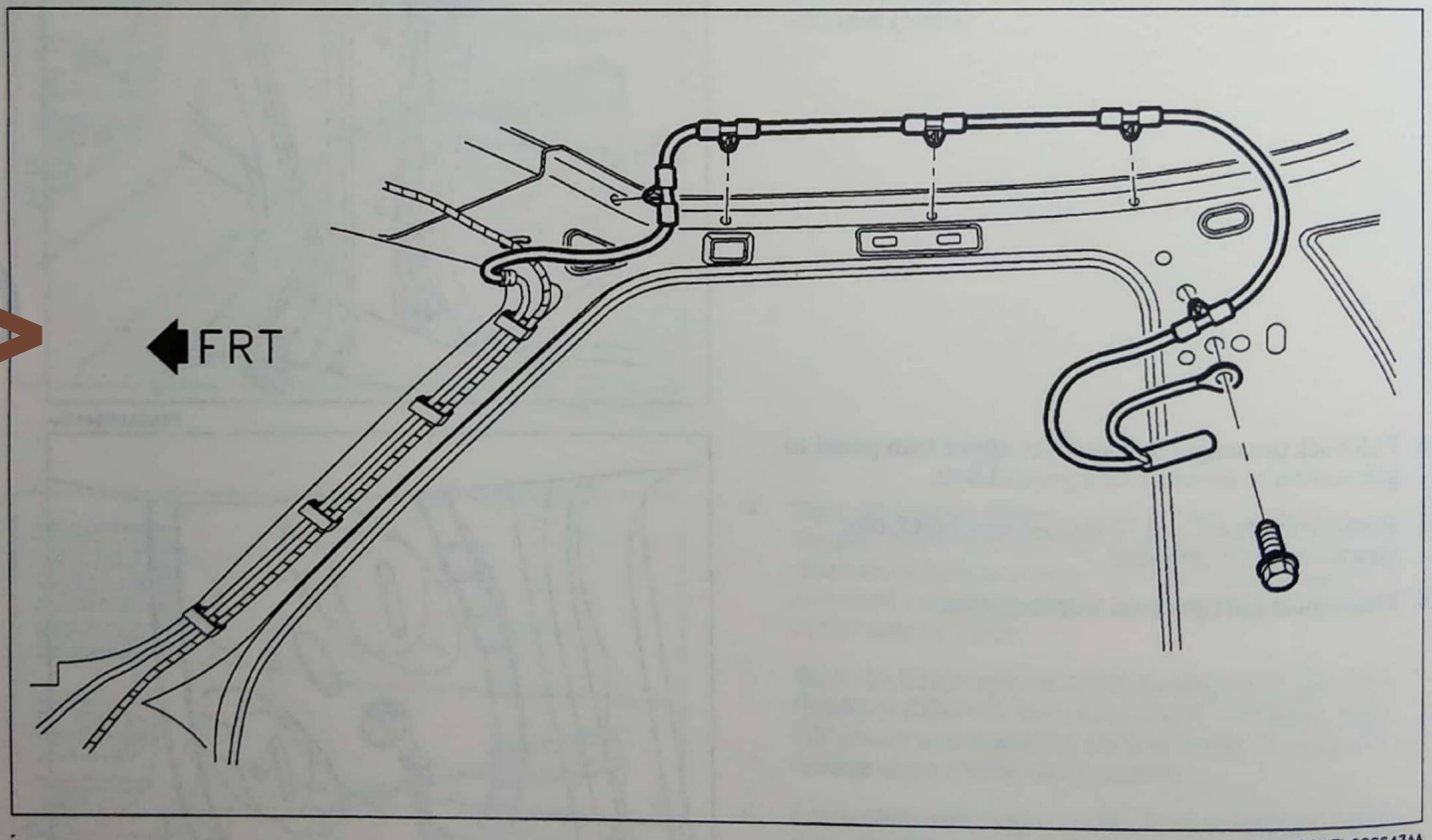
17. From passenger's side sunshade, remove screws and remove sunshade.



PSMVIS65737AA

18. Pull down passenger's side of headliner just enough to remove antenna lead rose bud clips from roof panel.
19. Remove antenna lead.

NOTICE: Be careful not to crease the headliner.



PSMELC66643AA

INSTALLATION

1. Install new antenna lead rose buds into roof panel.
2. Install antenna lead ground bolt and connect lead to antenna.

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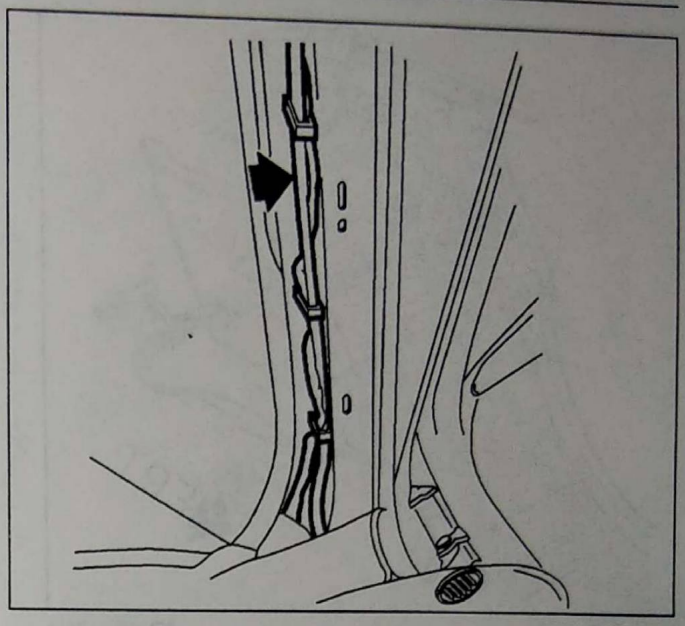
te antenna down A-pillar and under the
3- Wenger side knee beam support.

4. Clip antenna lead to harness.

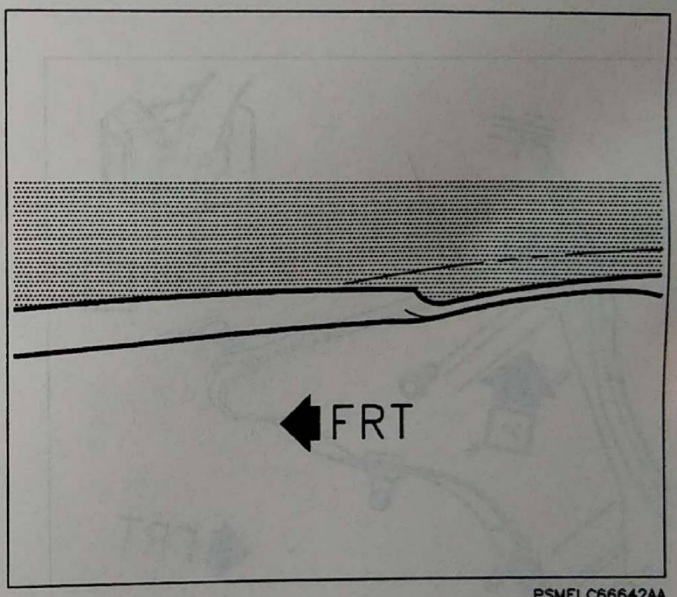
5. Snap antenna lead into A-pillar clips.



PSMELC66+43M

6. Reposition headliner under door weatherstrip.

7. Install windshield garnish molding. (Refer to "Windshield Garnish Molding" installation in this manual.)



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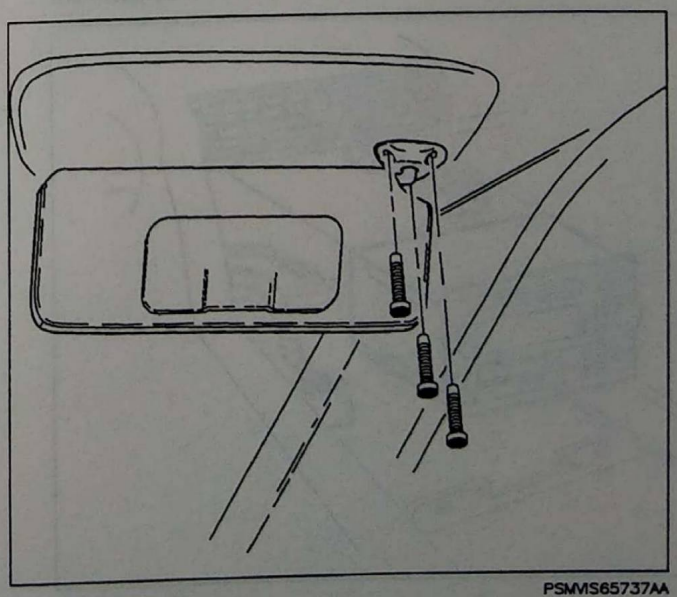
8. install sunshade and tighten screws.



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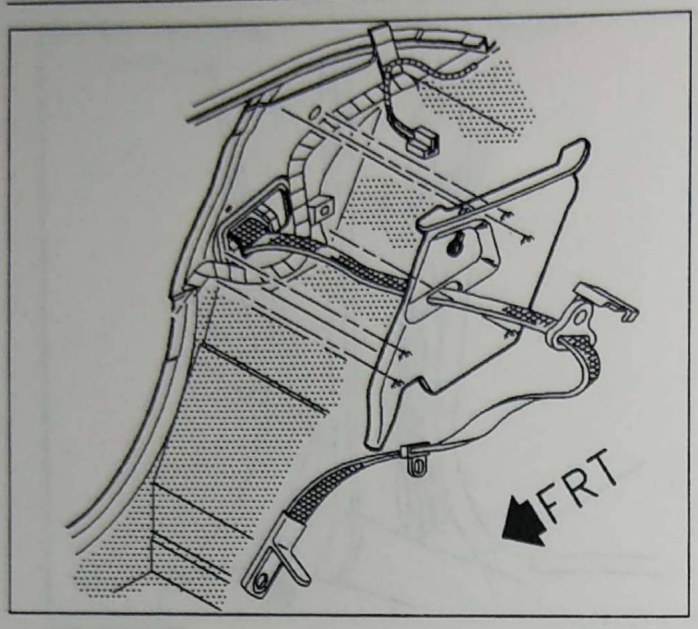
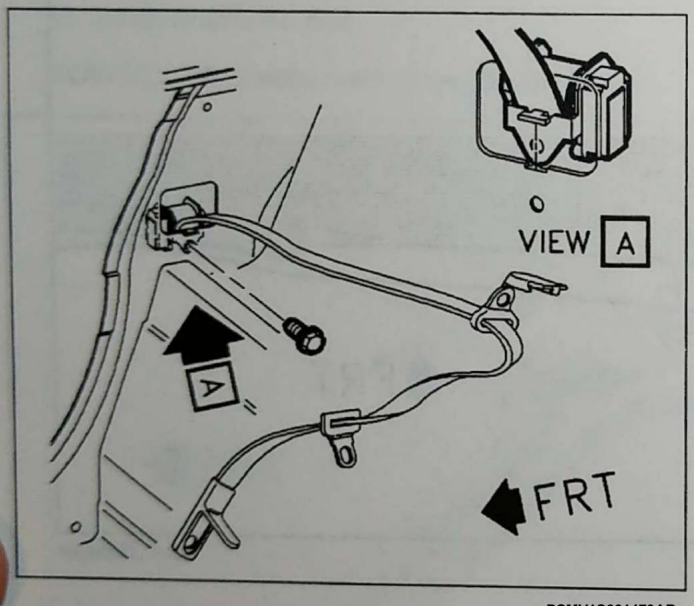


PSMVIS66131AA

9. Align clips on trim panel to slots in body and firmly at clip locations to seat clips, Press



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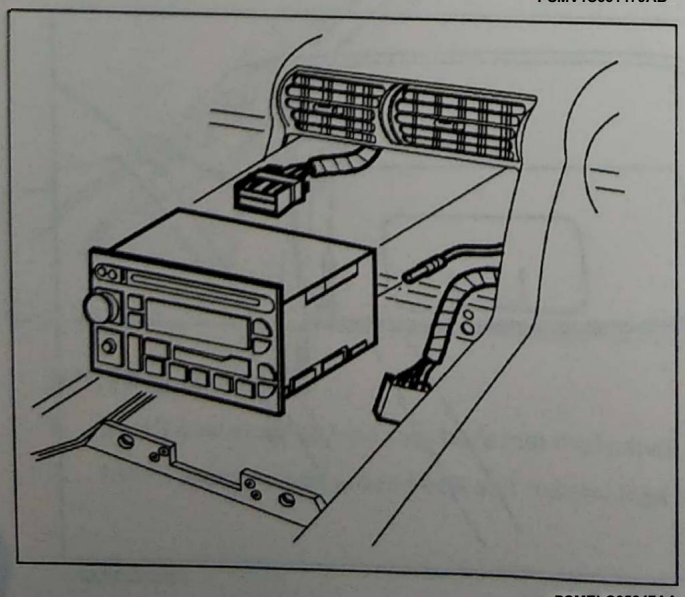
NOTICE: Use new bolt: torque retention of old bolt may not be sufficient.

10. Position seat belt D-ring to body attachment point and hand start new bolt. After bolt is started, tighten bolt.

Torque: 41 N*m (30 ft—lbs)

11. Route antenna lead into console cavity behind radio.
12. Reposition passenger side carpet.
13. Put the vehicle in RUN mode and shift to DRIVE, then select ACCY mode while in DRIVE.
14. Make sure the RSA is still protected with a clean shop rag over it. Connect radio harness to radio, then antenna lead to radio. Verify both connections are seated properly.



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15. Make sure antenna and harness are up and out of the way of the radio bracket. Slide radio into opening until the radio is seated and the radio fits tightly to the console. You may hear a click as the radio tab locks into the bracket.
16. With the service brake applied, select RUN mode again and shift to PARK.
17. Reset radio presets and tone settings if new radio was installed and they were recorded in step 1 of removal procedure.
18. Put the vehicle in run mode and shift to drive, then select accy mode while in drive, and the parking brake to prevent the vehicle from rolling unexpectedly.

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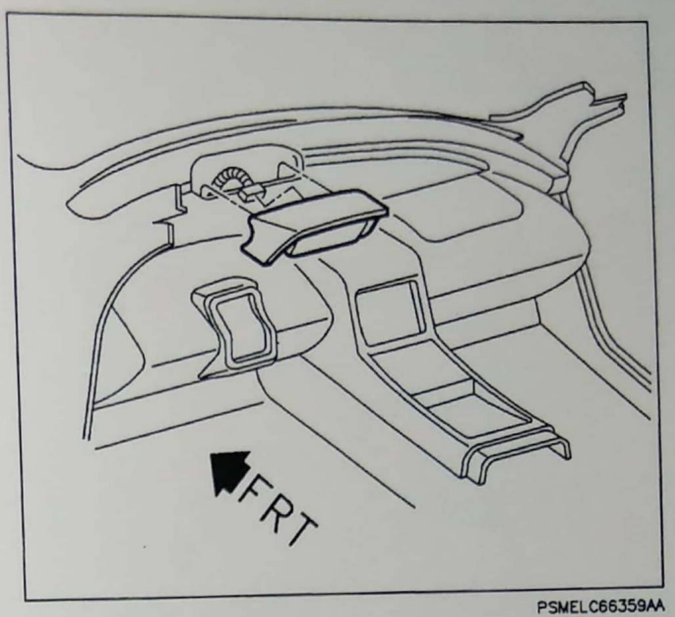
-JSTRUWIENT PANEL fisTER (IPC)



PSMELC66359AA

HEMOVAL

, ve instrument panel cluster by lifting upward and rearward.

isconnect the instrument panel cluster connector.

INSTALLATION

, Push harness connector into socket on cluster. Verify connection is made, seated and locked.

ll duster into instrument panel by pushing forward and downward.

IMPORTANT: When a new IPC is installed it must be reprogrammed with the VIN number and the mileage.

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SEAT BELT

CAUTION: REPLACE BELTS, RETRACTORS AND HARDWARE IN USE DURING ALL BUT MINOR COLLISIONS. REPLACE RETRACTORS AFTER COLLISIONS THAT THE INFLATOR MODULE HAS DEPLOYED WHETHER THE BELT WAS IN USE OR NOT. REPLACE RETRACTOR IF BLACK MARKS ARE PRESENT ON THE WEBBING. ALSO, RESTRAINT SYSTEMS SHOULD BE REPLACED AND ANCHORAGE'S PROPERLY REPAIRED IF THEY WERE IN AREAS DAMAGED BY A COLLISION, WHETHER THE BELT WAS IN USE OR NOT. IF THERE IS ANY QUESTION, REPLACE BELT SYSTEM. DAMAGE TO THE BELT SYSTEM, WHETHER VISIBLE OR NOT, COULD RESULT IN SERIOUS PERSONAL INJURY IN THE EVENT OF AN ACCIDENT.

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener to be of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread-locking compound, will be called out. The correct torque values must be used when installing fasteners that require them. If the above procedures are not followed, parts or system damage could result.

GENERAL DESCRIPTION

THREE-POINT SEAT BELT SYSTEM

Each front seat belt system (left and right) consists of one retractor, a latch plate, buckle, and a turning loop. The seat belt system incorporates an emergency locking retractor (ELR), which is designed to lock the seat belt webbing in place during emergency vehicle maneuvers. However, during all normal driving conditions the seat belt is free to unwind. The ELR system will lock the seat belt webbing under the following conditions:

- When the belt is pulled rapidly from the retractor.
- When the vehicle is accelerating or decelerating.
- When the vehicle is inclined.

The driver's seat belt includes a reminder lamp and tone alarm to warn the driver that the seat belt is not buckled when the vehicle is in the "RUN MODE." If the driver's seat belt is buckled, the tone alarm will not operate and the reminder lamp will turn Off.

If the driver's seat belt is not buckled, the sound signal will provide an audible reminder for about eight seconds. The seat belt telltale will remain On and stay On until the driver's safety belt is buckled.

If the driver's safety belt remains unbuckled a single chime will sound every five minutes and the "check message light will come On for about seven seconds.

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ON: THE FO LO E
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T BELT SYSTEM. 1FTHESF PRF^Sinlt™11
SE4 N0TTAKEN. THE SEAT BELT SYSTCAT.\U,?°NS ARP
PROVIDE PROPER RESTRAINT IN THE NOT
EVENT OF AN ACCIDENT AND MAY RFe^i,IKELY
PERSONAL INJURY. Y RESULT IN

- Keep any sharp and potential damaging objects away from the belts.
- Avoid bending or damaging any portion of the buckle.
- Do not bleach or dye belt webbing (use only mild soap and water).
- When installing seat belt anchor bolts, start bolts by hand to prevent cross-threading.
- Do not attempt any repairs on retractor mechanisms or covers. Replace defective assemblies with new ones.
- Replace any belts that are cut or damaged in any way.
- Do not install anything in trim panel that will obstruct the movement of the seat belt.

SHOULDER RETRACTORS

Shoulder belt retractors will lock if the vehicle exceeds 15 * 045 degrees angle or exceeds 0.30 — 0.70g of deceleration force. Both retractors will lock under hard cornering or while descending a winding downhill grade. The retractors may also lock while braking to stop at a downhill intersection. Both retractors will unlock when 6.35mm (1/4 in) of the belt is fed back into the retractor.

RUNNING TEST ELR SEAT BELTS

CAUTION: CONDUCT THIS TEST ONLY IN A SAFE AREA. DO NOT CONDUCT THIS TEST O H N T E OPEN ROAD. A LARGE EMPTY PARKING LOT IS SUITABLE.

1- Fasten seat belt.

2. Drive vehicle at 16 km/h (10 mph) and apply brakes firmly.

3- Verify the seat belt locks and does not allow yo ur body to move forward.

4- If the belt does not lock during the running test, remove retractor and perform the static test.

STATIC TEST

1 Remove retractor assembly. (Refer to Seat "B elt System" in this manual.)

2. Tilt the retractor slowly.

3. Verify the belt can be pulled out of the retractor at cannot an inclination of 15 degrees or less/nc*t at it be pulled out at over 45 degrees of inclinati n "tion.

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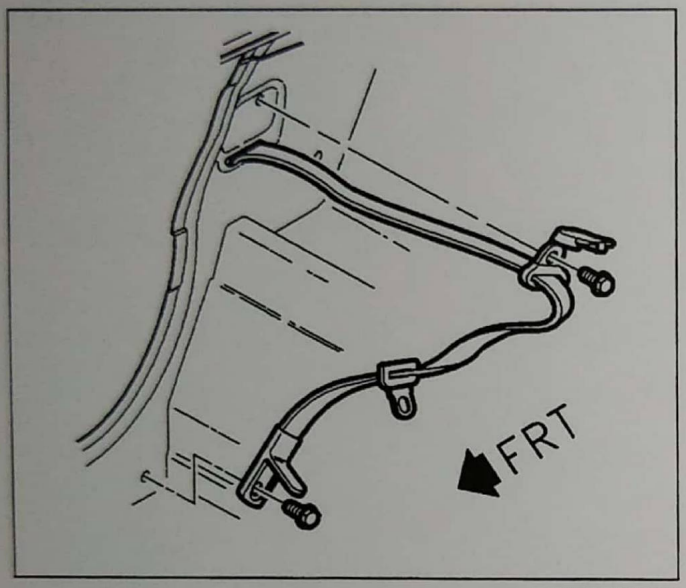
SAFETY BELT OPERATIONAL CHECKS

The latch plate should move up and down easily on the belt. An audible c/icA should be heard when the latch plate is inserted into the buckle. Check attachment of latch plate to buckle by grasping the belt and pulling firmly. The belt should not disconnect from the buckle.The belt should disconnect easily when the button on the buckle is pushed in.

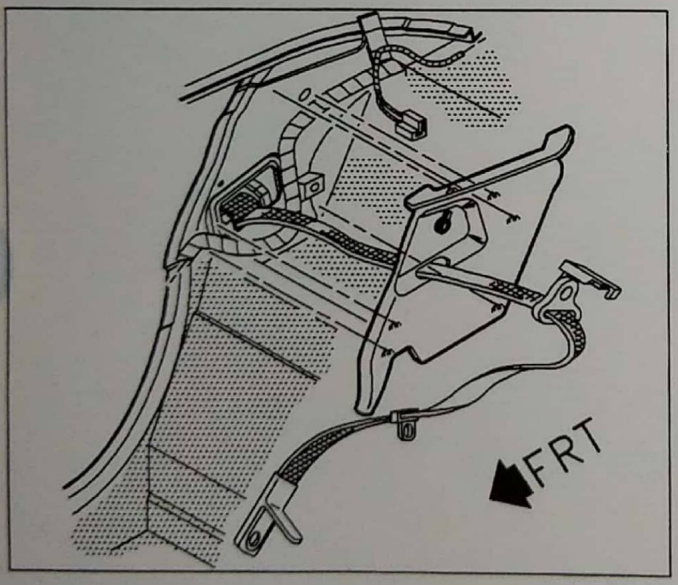


PSMVIS66147AA

RETRACTOR ASSEMBLY

REMOVAL

1. Remove lower seat belt anchor bolt at floor pan.
2. Unclip D-ring cover from upper seat belt anchor.
3. Remove upper seat belt anchor bolt.



PSMVIS66131AA

4. Starting at bottom of quarter upper trim panel, pull firmly on trim panel at clip locations to release clips.
5. Disconnect wire harness to accessory power outlet plug housing on right side.
6. Feed seat belt through trim panel.

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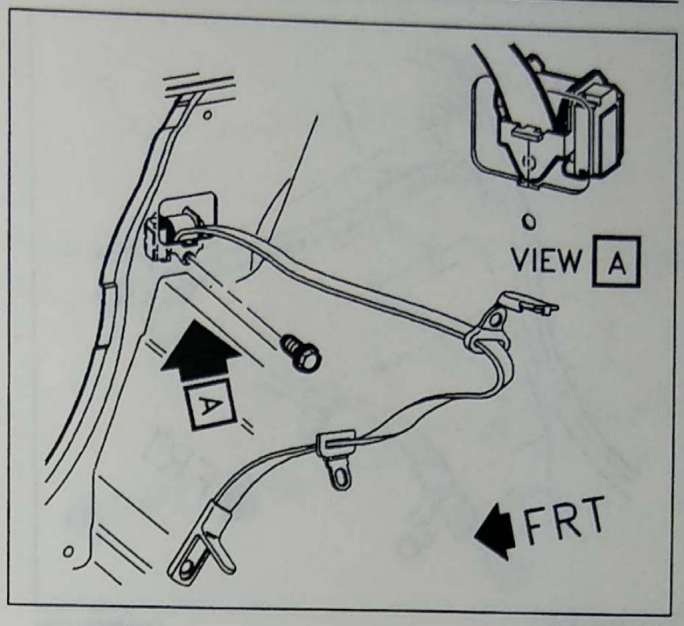
ve bolt from seat belt retractor. Remove scat
7' Retractor from B-pillar opening.



PSMVIS661479AS

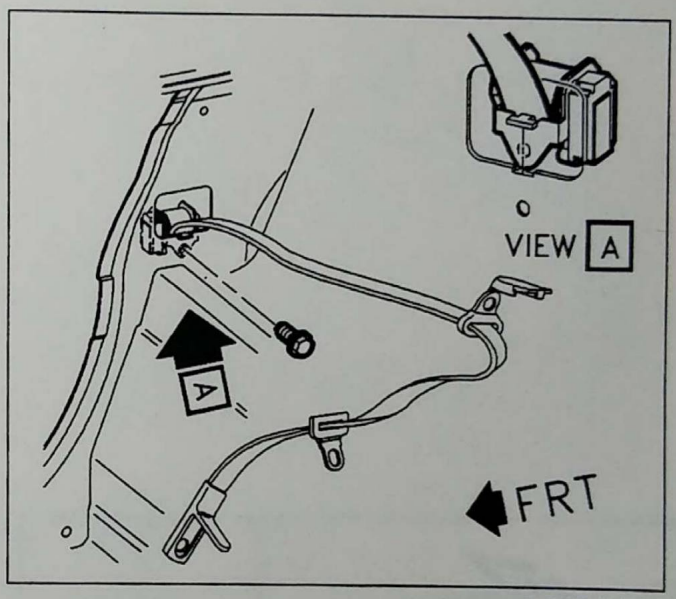
INSTALLATION

1. Insert retractor in B-pillar mounting location.

NOTICE: Use new bolt; torque retention of old bolt **may not** be sufficient.

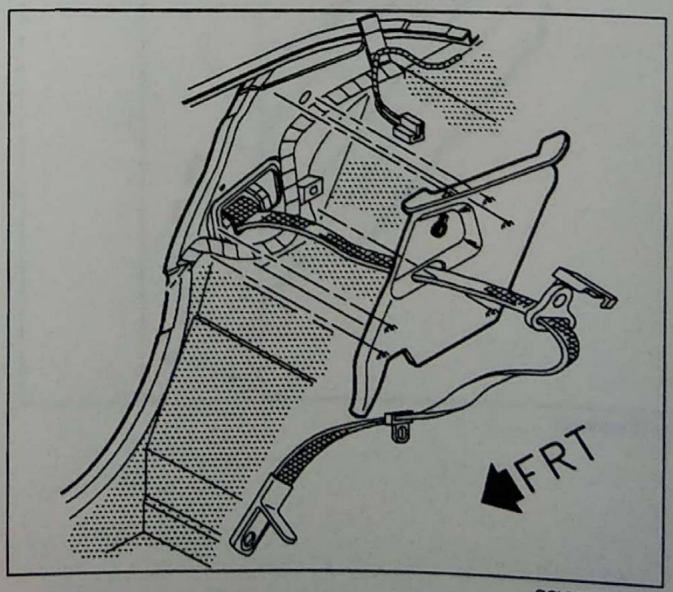
2. Hand start new seat belt anchor bolt. After bolt is started, tighten bolt.

Torque: 41 N-m (30 ft-lbs)



PSMVIS661479AB

3. Route seat belt trough trim panel. Make sure belt is not twisted
4. Connect wire ha housina nn ess t0 accessory power outlet plug in Sbright hand side.
5. Align clips o t in firmly auiip^Q^- ^ane^t0 s^ots body and press ons to seat.



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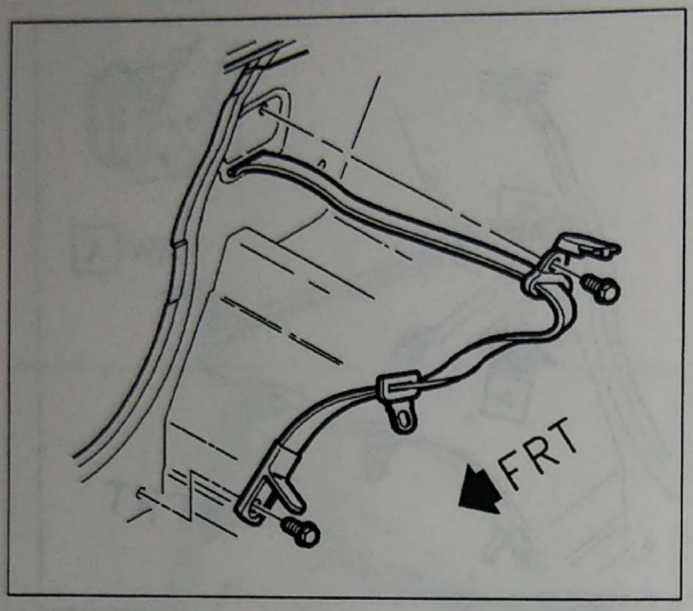

PSMVIS66147M

NOTICE: Use new bolt; torque retention of old bolt may not be sufficient.

6. Position seat belt D-ring to body attachment point and hand start new bolt. After bolt is started, tighten bolt.

Torque: 41 N*m (30 ft—lbs)

7. Close upper seat belt anchor cover on D-ring.

NOTICE: Use new bolt; torque retention of old bolt may not be sufficient.

8. Position lower seat belt to floor pan attachment point and hand start new bolt. After bolt is started, tighten bolt.

Torque: 41 N*m (30 ft—lbs)

9. Check seat belt unit installation for twists and operation of retractor.

SEAT BELT RETRACTOR BUCKLE ASSEMBLY

The seat belt retractor buckle assembly is part of the seat assembly and is not serviced seperately.

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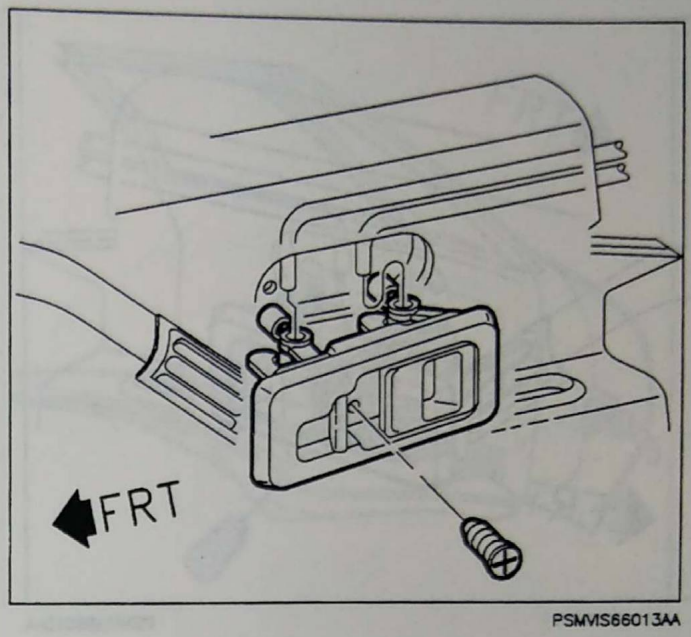
INTERIOR DOOR COMPONENTS

INSIDE DOOR HANDLE



PSMVIS66013AA

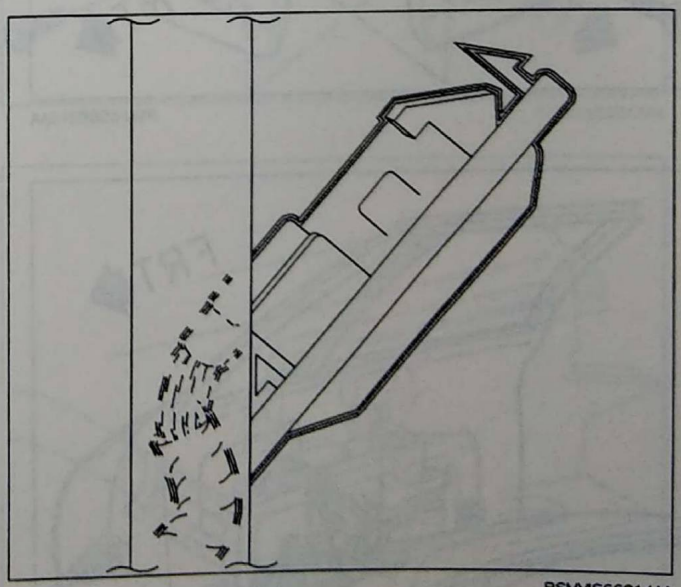
REMOVAL

1. Remove screw from door handle, slide door handle assembly forward and outward.
2. Using a long thin screwdriver, disengage lock and latchrods from retainer.
3. Remove handle assembly.

INSTALLATION

1. Position door handle assembly into trim panel.
2. Tip handle outward at top. Lift latch and lock rods into retainers and latch retainer clamps.
3. Push handle into trim panel and slide rearward to engage tangs.
4. Install screw in handle and tighten screw.

INSIDE ELECTRIC DOOR LOCK SWITCH


PSMVIS66014AA

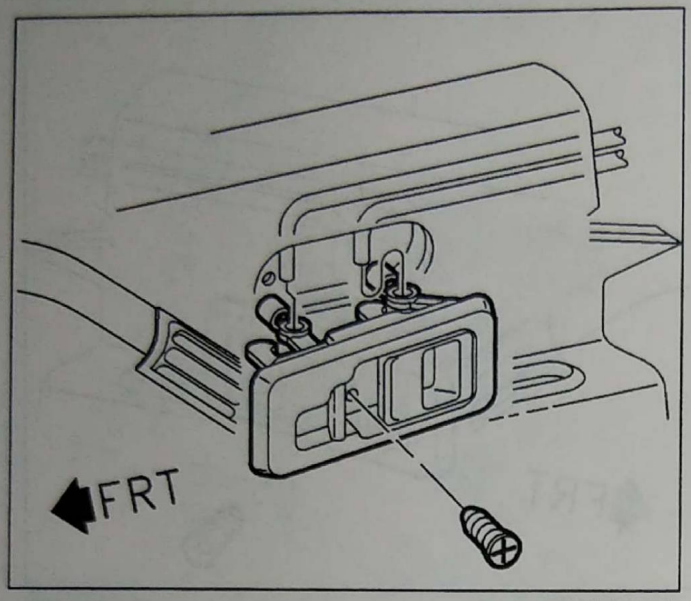
REMOVAL

1. Pry at top of switch through notch with a small, straight screwdriver, covering the blade with tape to protect the surface.
2. Disconnect door lock switch wire harness connector.
3. Remove switch.

INSTALLATION

1. Connect door lock switch wire harness.
2. Engage lower tab first, then rotate toward handle to upper retaining tab.

CamScanner

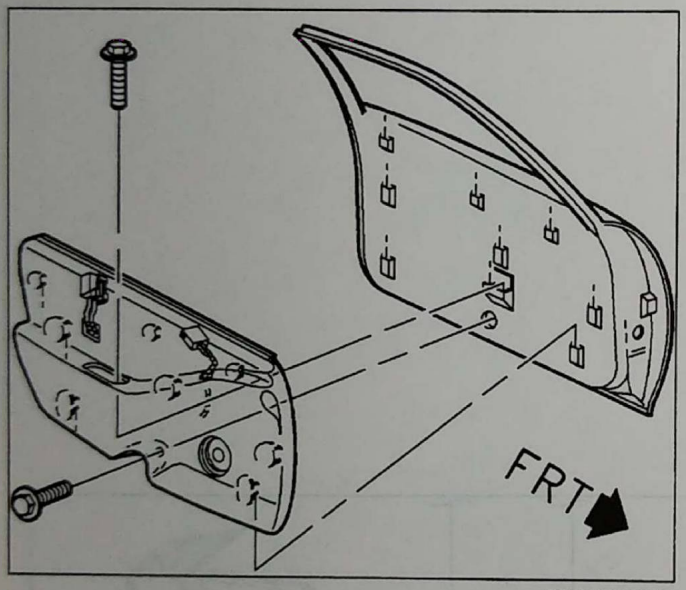


PSMVIS66013AA

DOOR TRIM PANEL

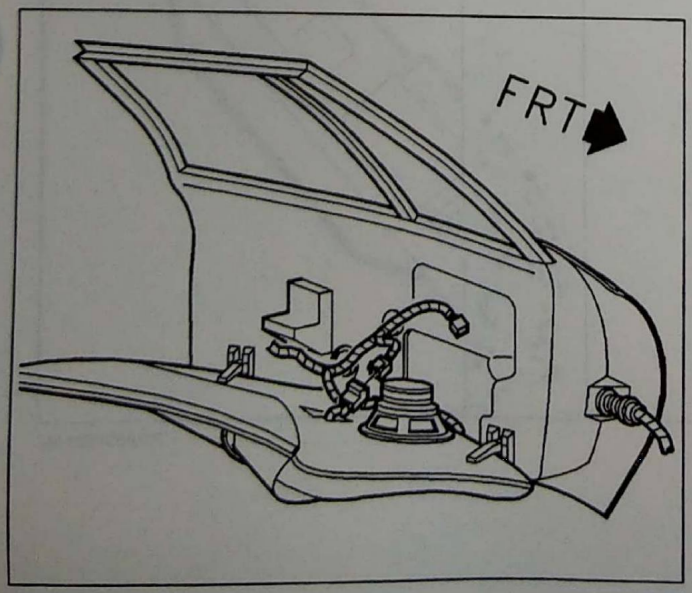
REMOVAL

1. Remove screw from door handle, slide door handle assembly forward and outward.
2. Using a long thin screwdriver, disengage lock and latch rods from retainer.
3. Remove handle assembly.



PSMVIS66015AA

4. Remove screws from door pull cup.
5. Remove screws from bottom of the trim panel in the center.
6. Slide trim panel upward to release retainers.
7. Lift trim panel away from car slightly.



PSMVIS66016M

8. Disconnect inside door lock switch connector.
9. Disconnect outside remote mirror switch connector.
10. Disconnect front speaker connector.
11. Remove trim panel from car.

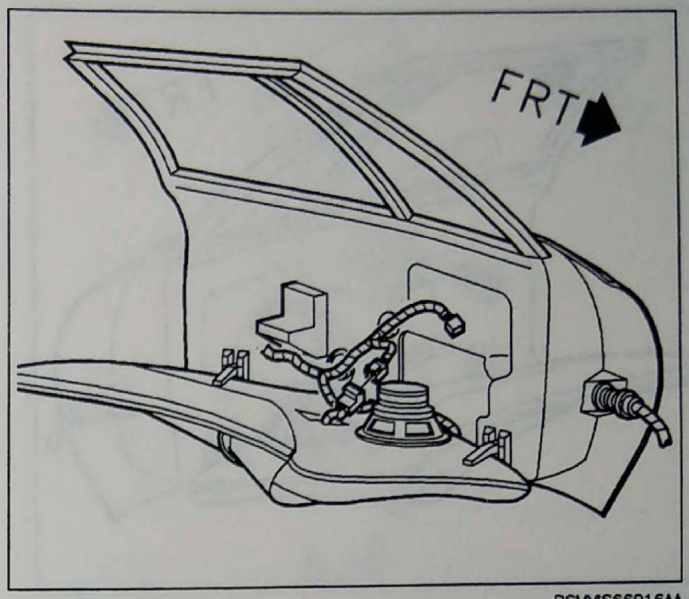
CamScanner

INSTALLATION

] Connect front speaker connector.

-i Connect outside remote mirror switch connector.

3. Connect inside door lock switch connector.

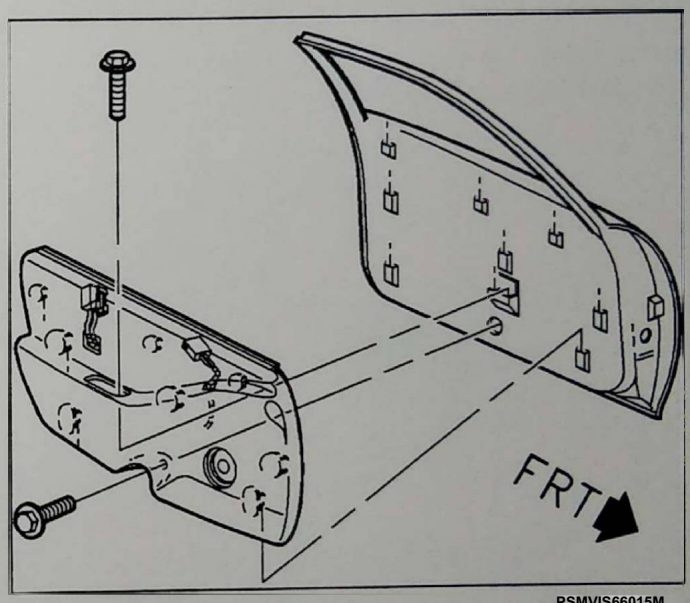


PSMVIS66016AA

4. Align trim panel retainers to door inner panel and then slide trim panel down to engage retainers.

5. Install screw to bottom of trim panel in the center and tighten screw.

6. Install screws to door pull cup and tighten screws,



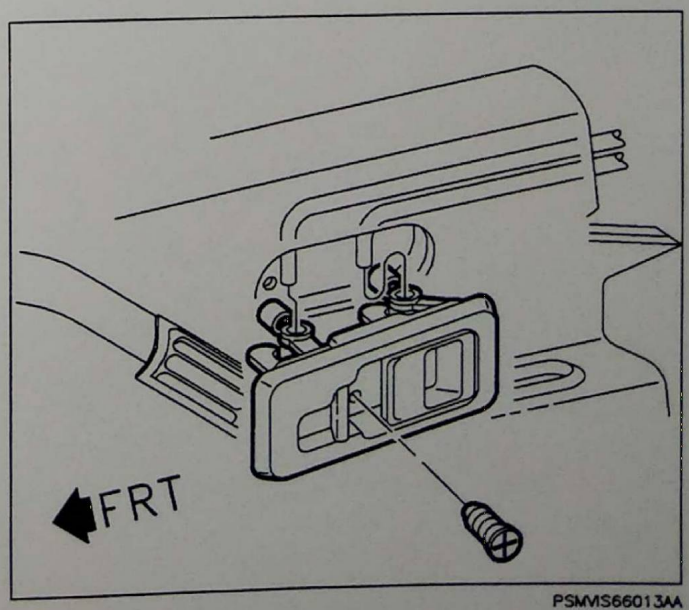
PSMVIS66015M

7. Position door handle assembly into trim panel.

8. Tip handle outward at top. Lift latch and lock rods into retainers and latch retainer clamps.

9- Push handle into trim panel and slide rearward to engage tangs.

10- Install screw in handle and tighten screw.



PSMVIS66013AA

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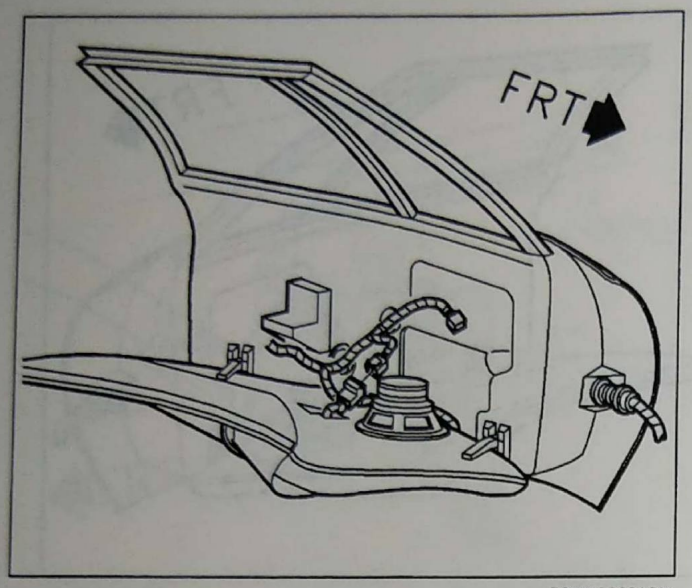

PSMVIS66016AA

FRONT DOOR SPEAKER

REMOVAL

1. Remove door trim panel. (Refer to “Door Trim Panel” removal in this manual.)
2. Remove screws from speaker grill on the back side of the door trim panel.
3. Remove speaker grill from door trim panel.

INSTALLATION

1. Align speaker grill to door trim panel.
2. Install screws from the back of the door trim panel to the speaker grill and tighten screw.
3. Install door trim panel. (Refer to “Door Trim Panel” installation in this manual.)

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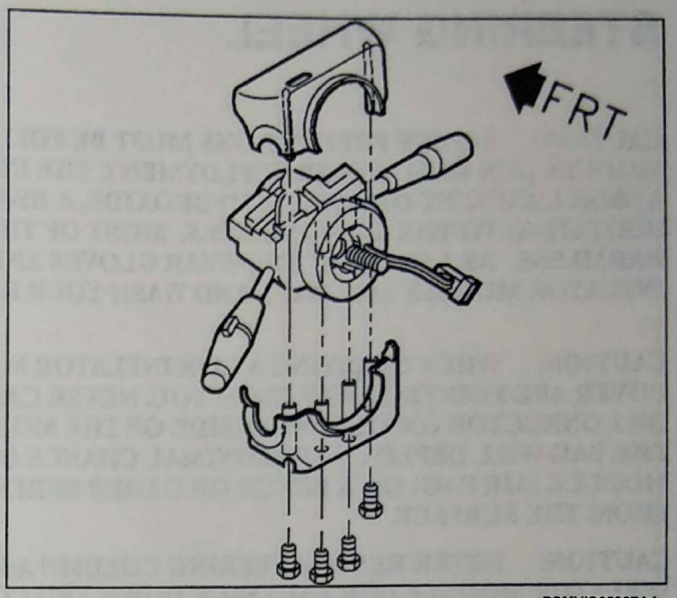
STEERING COLUMN TRIM COVER



PSMVIS65827AA

REMOVAL

1. Disable the SIR system. (Refer to "Disabling the SIR system" in this manual.)
2. Remove outer screws from lower steering column trim cover, lift upper trim panel off.
3. Remove inner screws from lower steering column trim cover and remove lower trim cover.

INSTALLATION

1. Align lower steering column trim cover to steering column and install inner screws.
2. Align upper steering column trim panel to steering column and install outer screws in lower steering column trim panel
3. Enable the SIR system. (Refer to "Enabling the SIR system" in this manual.)

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STEERING WHEEL

CAUTION: SAFETY PRECAUTIONS M«ST f nyBn WHEN HANDLING A DEPLOYED INFLATOR EFOLLOVVE 'V“ O DULE (AIR BAG) SURFACE MAY CONTAIN MODULE (AIR BAG). AFTER DEPLOYMENT,/THE IINRATOR \ DEPLO YMENT REACTION, THAT IS A SMALL AMOUNT OF SODIUM HYDROMDE, A BY-PRODU CT OF THE THE inflatqr MOD ULE (AIR BAG) IS IRRITATING TO THE SKIN AND EYES. MOSTOF THE PO WDER ON GLASSES WHEN HANDLING A DEPLOYED HARMLESS. AS A PRECAUTION, WEAR GLOVES AND SAFETY ILD SOAP AND WATER AFTERWARDS. INFLATOR MODULE (AIR BAG), AND WASH YOUR HANDS WITH M WITH M

CAUTION: WHEN CARRYING A LIVE INFLATOR MODULE (AIR BAG), MAKE SURE THE BAG AND TRIM COVER ARE POINTED AWAY FROM YOU. NEVER CARRY INFLATOR MODULE (AIR BAG) BY THE WIRES OR CONNECTOR ON THE UNDERSIDE OF THE MODULE. IN CASE OF AN ACCIDENTAL DEPLOYMENT, THE BAG WILL DEPLOY WITH MINIMAL CHANCE OF INJURY. WHEN PLACING A LIVE INFLATOR MODULE (AIR BAG) ON A BENCH OR OTHER SURFACE, ALWAYS FACE BAG AND TRIM COVER UP, AWAY FROM THE SURFACE.

CAUTION: NEVER REST A STEERING COLUMN ASSEMBLY ON THE STEERING WHEEL WITH THE INFLATOR MODULE (AIR BAG) FACE DOWN AND COLUMN VERTICAL. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE INFLATOR MODULE (AIR BAG) TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY COULD RESULT.

IMPORTANT: In the event deployment has occurred, refer to “Repairs and Inspections Required After an Accident” in the “SIR” Service Manual).

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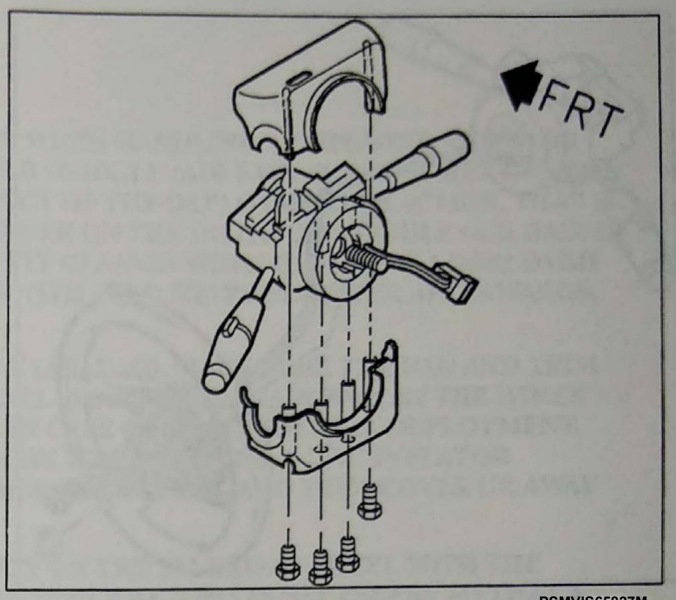
STEERING WHEEL

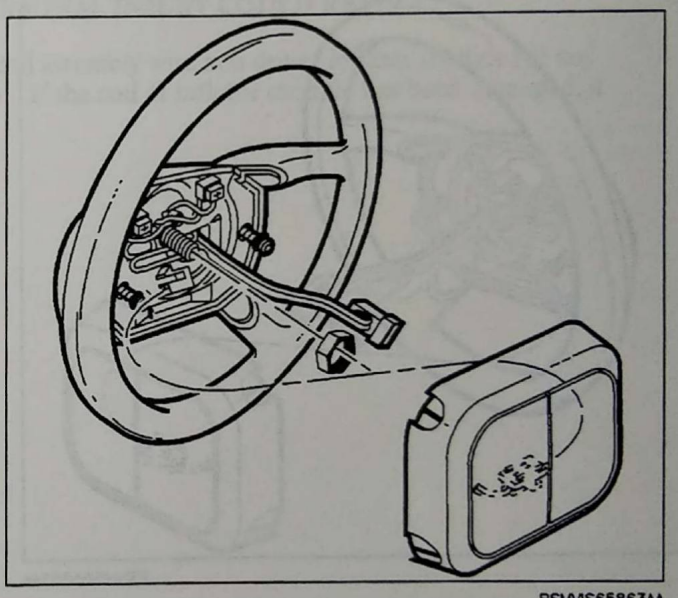
REMOVAL

1. Disable the SIR system. (Refer to "Disabling the SIR System" in this manual.)
2. Remove outer screws from lower steering column trim cover and lift upper trim panel off.
3. Remove inner screws from lower steering column trim cover to remove lower trim cover.



PSMVIS65827M

4. Remove screws from back of steering wheel that retains the SIR inflator module. Remove connector position assurance (CPA) from SIR inflator module connector and disconnect connector. Remove SIR inflator module.

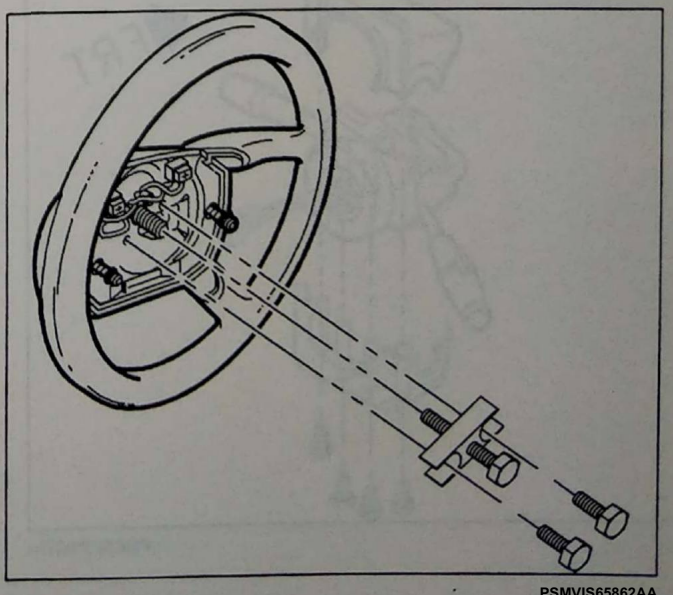


PSMVIS65863AA

5- Disconnect horn switch connector.

6. Remove nut from steering column that retains steering wheel.

7- Install steering wheel puller SA9218NE and remove steering wheel.



PSMVIS65862AA

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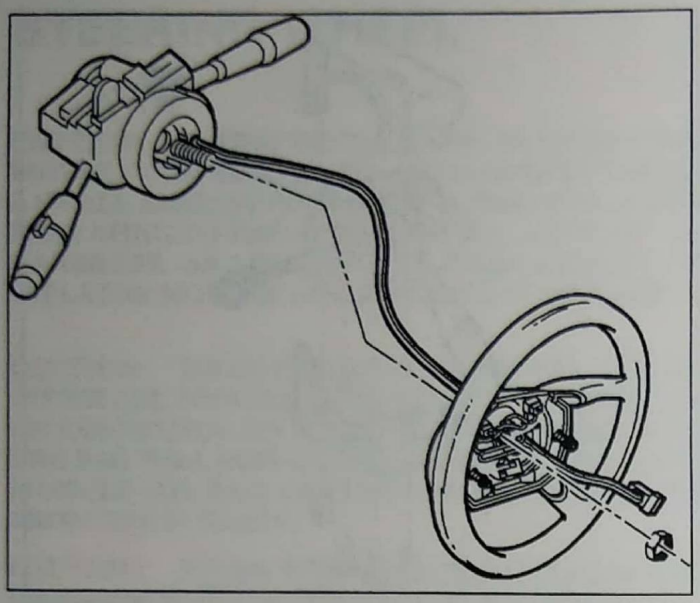
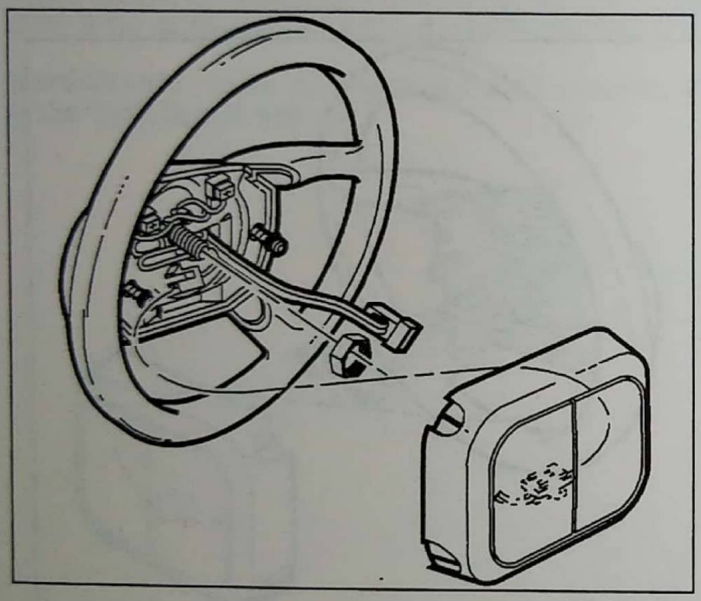


PSMVIS65864AA

INSTALLATION

1. Route SIR cable through steering wheel. Install steering wheel to column. Connect horn wire connector.
2. Install steering wheel nut.

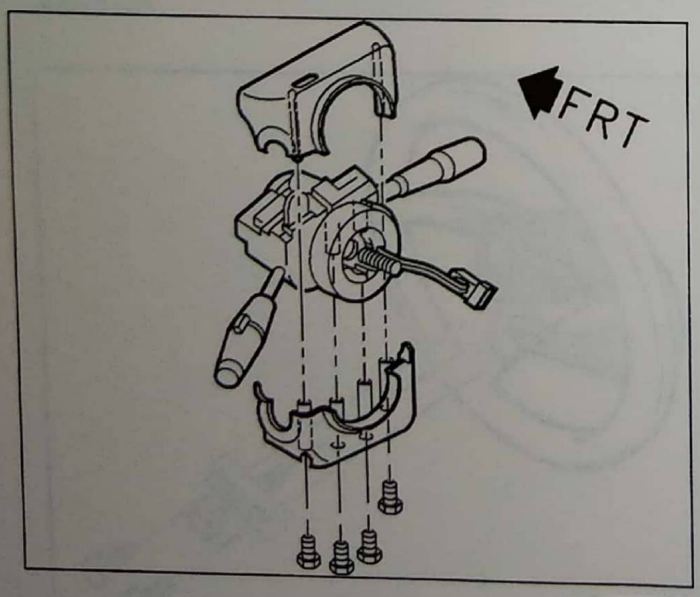
Torque: 42 N*m (31 ft—lbs)



PSMV1S65863M

3. Route yellow SIR inflator module wire harness within the steering wheel hub forming an “S” shape with wire.
4. Connect inflator module connector and install CPA.
5. Install SIR inflator module to steering wheel.

Torque: 10 N*m (7 ft—lbs)



PSMV1S65827AA

6. Install lower steering column trim cover to steering column and install inner screws.
7. Install upper steering column trim panel to steering column and install outer screws in lower steering column trim panel.
8. Enable the SIR system. (Refer to “Enabling the SIR System” in this manual.)

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STEERING COLUMN

CAUTION: SAFER XA LIONS MUST'BEFOLLOWED WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG). _ AFTER DEI CLIENT rHE INFLATOR MODULE (AIR BAG) SURFACE MAY CONTAIN A SMALL AMOI JT ^F SO! IUM ^TOROXIDE, A BY-PRODUCT OF THE DEPLOYMENT REACTION, THAT IS IRRITATING TO THE SKIN AND I.YES- MOST OF THE POWDER ON THE INFLATOR MODULE (AIR BAG) IS HARMLESS. AS Al REGAL I ION, WEAR GLOVES AND SAFETY GLASSES WHEN HANDLING A DEPLOYED INFLATOR MODULE (.AIR BAG), AND WASH YOUR HANDS WITH MILD SOAP AND WATER AFTERWARDS.

CAUTION: WHEN CA NG A D COAFR ARE POINTEDX raoHKS ULE (AIR BAG)' MAKE SURE THE BAG AND TRIM ORSS IONINFLATOR MODULE (AIR BAG) BY THE-WIRES

?5F **RAC W1I I DFPI** OYVITTOSM*?^ **MODULE_IN CASE OF AN ACCIDENTAL DEPLOYMENT, Iimri F AIR RACOON A** RFN£I! **OF INJURY- WHEN PLACING A LIVE INFLATOR FROM THE SURFACE A BENCH OR 0THER SURFACE, ALWAYS FACE BAG AND TRIM COVER UP, AWAY**

CAUTION: NEVER REST» A^SJ?^NG C0LUMN ASSEMBLY ON THE STEERING WHEEL WITH THE INFLATOR MODULE (AIR BAG,' EACE DOWN AND COLUMN VERTICAL. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALL0W THE INFLATOR MODULE (AIR BAG) TO EXPAND IN THE UNLIKELY ENTNT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY COULD RESULT.

IMPORTANT: In the event deployment has occurred, inspect coil assembly wire and driver inflator module for any signs ŏt scorching, melting or other damage due to excessive heat. If the coil or inflator module has been damaged, it must be replaced.

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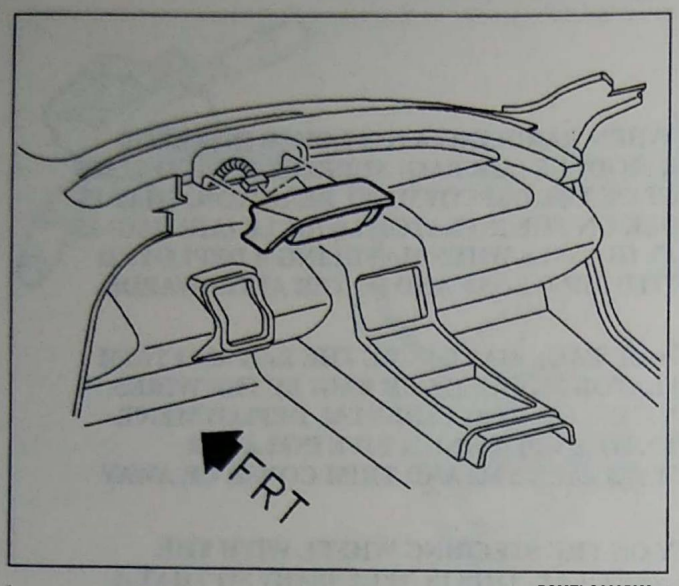
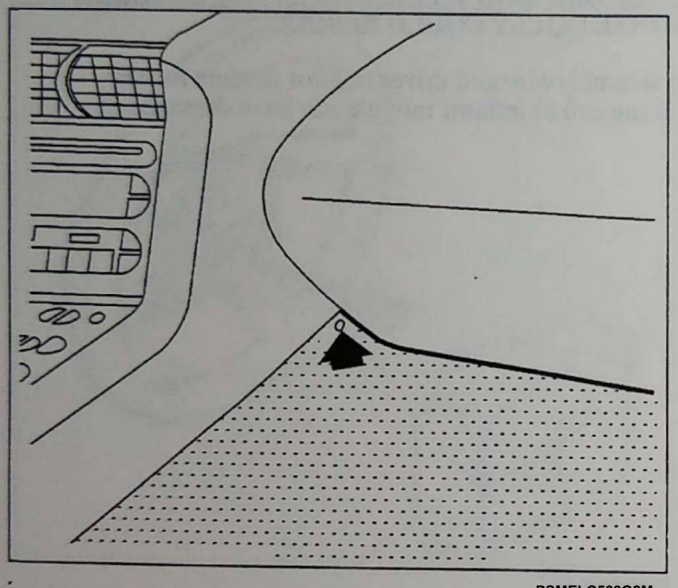
STEERING COLUMN

REMOVAL



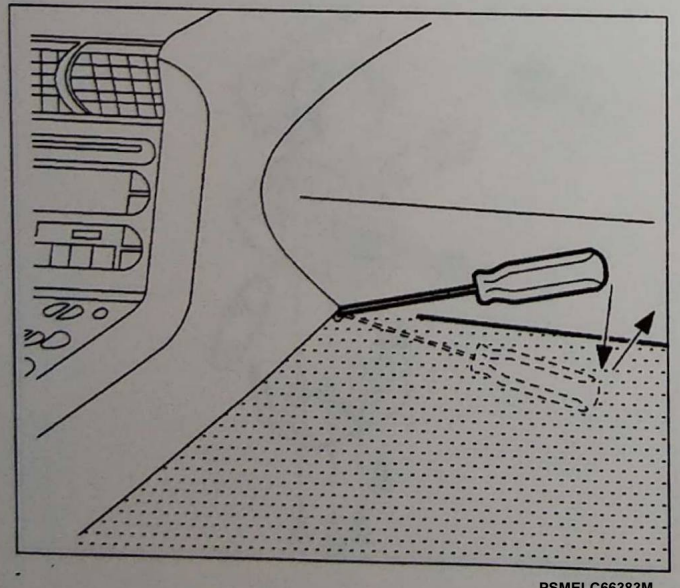
PSMELC66359M

1. Disable the SIR system. (Refer to “Disabling the SIR System” in this manual.)
2. Remove instrument panel cluster (IPC) by lifting upward and rearward, disconnect the IPC connector.



PSMELC563Q2M

3. Locate hole in instrument panel tunnel bracket on right side behind carpet.
4. Use a knife to make a small slit in carpet over the hole.



PSMELC66383M

5. Insert a screwdriver with a blade about 152-304 mm (6 in.-12 in.) long into the hole in the instrument panel tunnel bracket. Slide screwdriver along instrument panel radio bracket until the screwdriver is wedged between bracket and the radio lock tab. The screwdriver should be inserted about 152mm (6 in.).

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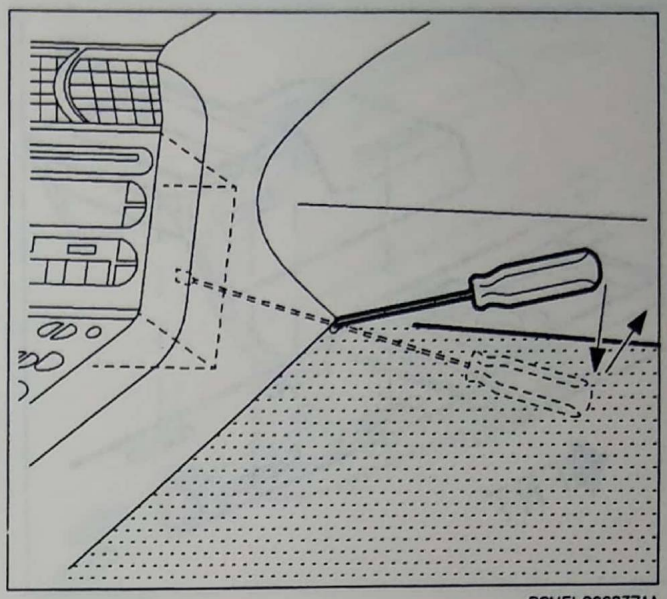
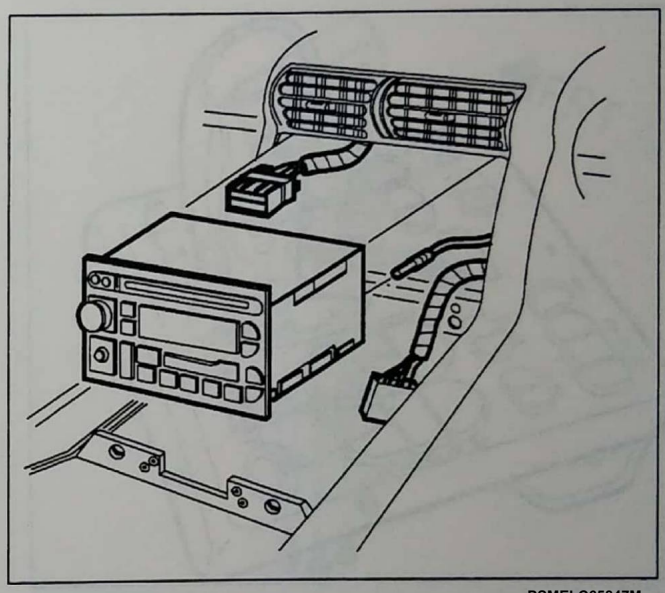
6. Push downward then forward on the screwdriver handle, lifting the lock tab upward and the radio rearward simultaneously. The radio should move rearward enough so that it can be pulled out the rest of the way by hand.
7. With the brake applied, shift run/lock shift assembly (RSA) to DRIVE, then select ACCY mode to shut Off power and apply the parking brake to keep the vehicle from rolling unexpectedly.
8. Lay a clean shop rag over the RSA to help protect it from getting scratched by the radio case during radio removal.
9. Slide radio out of instrument panel.



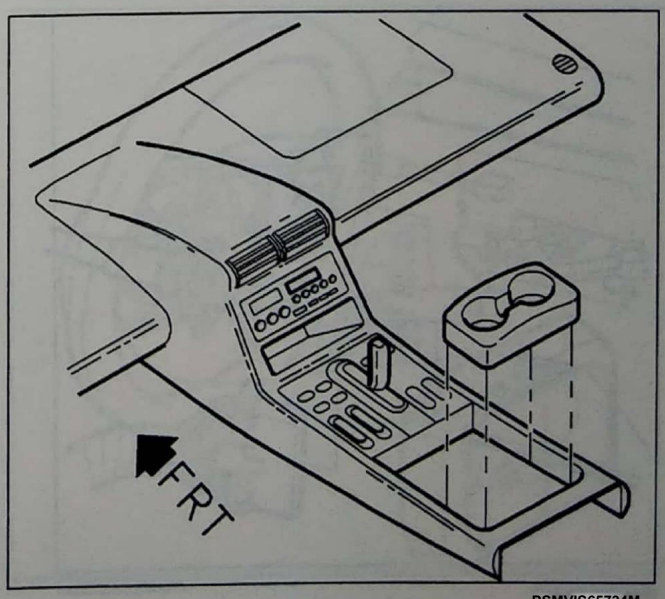
PSMELC66837AA

10. Disconnect the antenna lead first, then the harness connector.
11. With the brake applied, select the RUN mode again, and shift back to PARK. Then select the lock mode to turn the vehicle Off.



PSMELC65847M

12. Remove cup holder.



PSMVIS65734M

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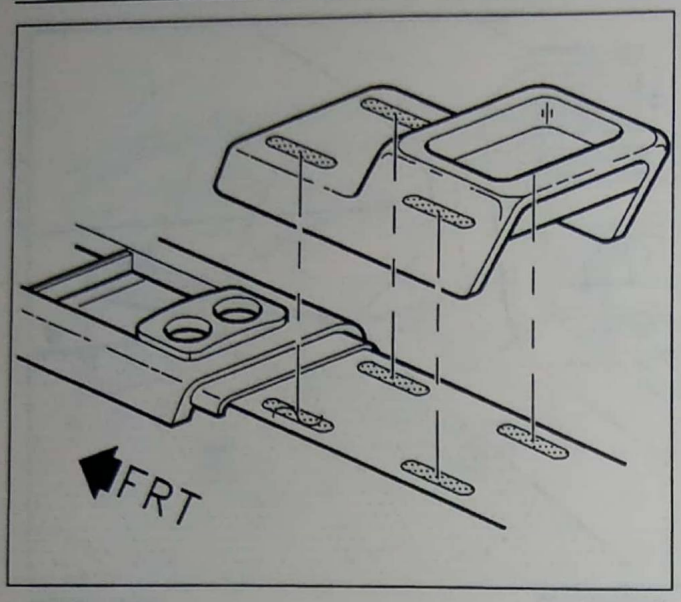
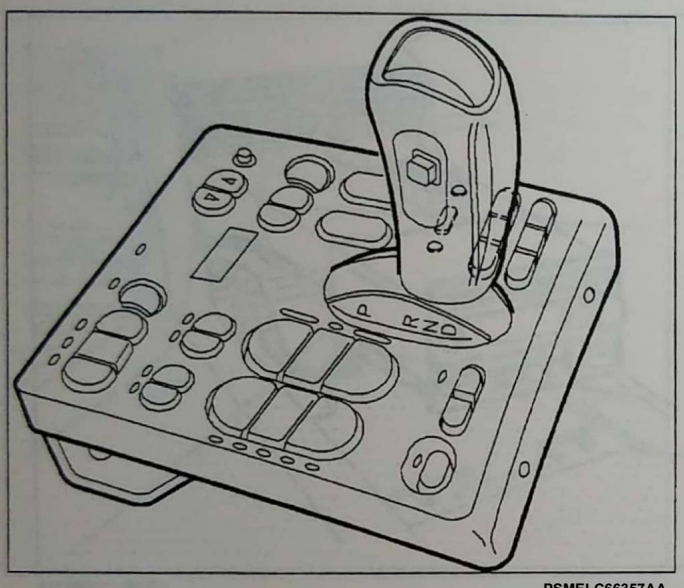


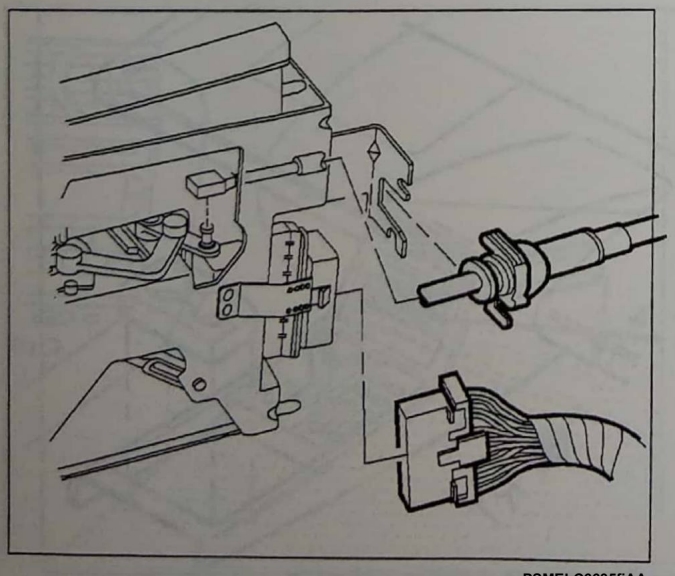
PSMVIS65735M

13. Remove arm rest from tunnel by lifting upward releasing Dual-Lock retainers.



PSMELC66357AA

14. Remove the screws in the rear of the RSA, pull RSA rearward about 63 mm (2.5 in.).



PSMELC6635fiAA

15. Rotate RSA towards the drivers side of the vehicle to a 45 degree angle.
16. Disconnect the RSA wire harness connector.
17. Disconnect the shift cable from the shifter and remove shift cable from retainer bracket by prying locking tab on drivers side of RSA gently and pushing cable down out of bracket.

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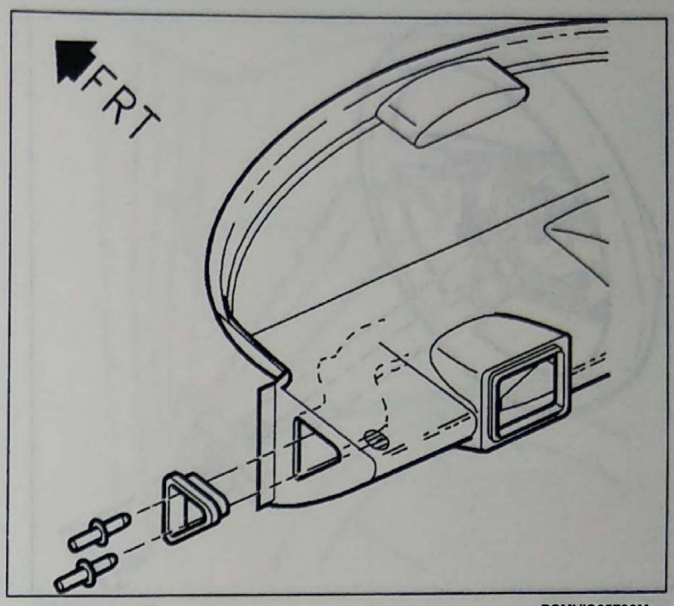
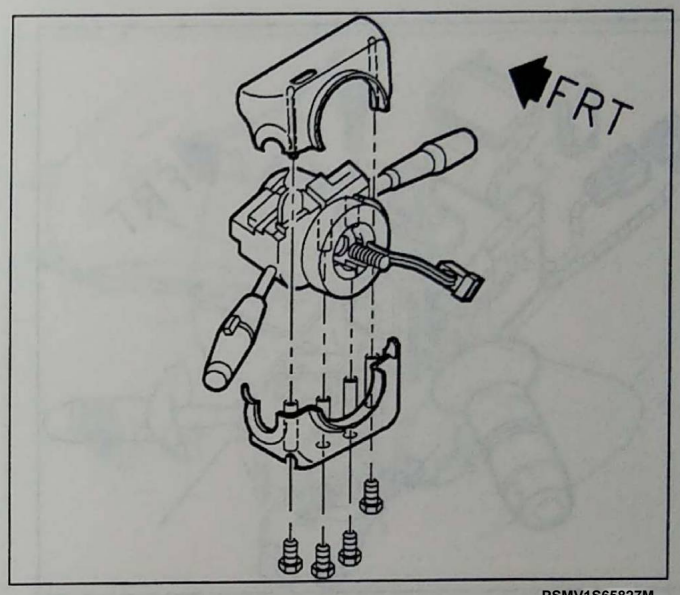
18. Drill out rivets from side door air outlets.
19. Remove left and right front side door air outlets on the side of instrument panel with doors open.



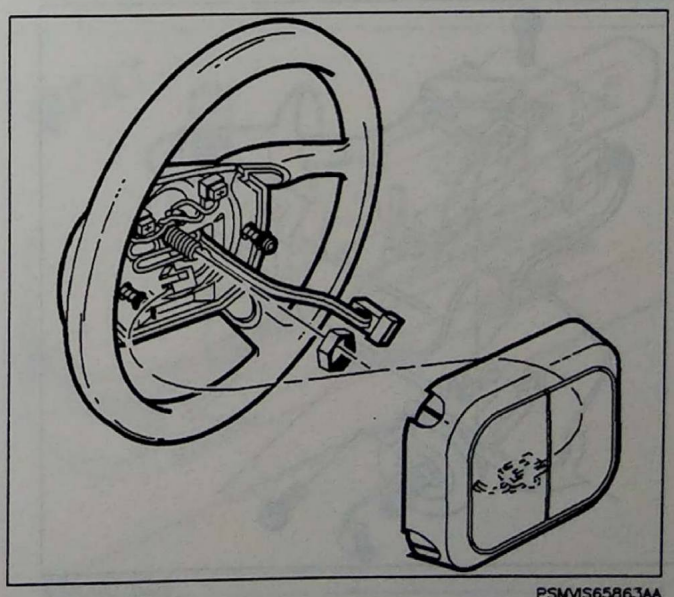
PSMVIS65736M

20. Remove outer screws from lower steering column trim cover, lift upper trim panel off.
21. Remove inner screws from lower steering column trim cover and remove lower trim cover.



PSMV1S65827M

22. Remove screws from back of steering wheel that retains SIR inflator module.
23. Remove connector position assurance (CPA) and disconnect inflator module connector.
24. Remove SIR inflator module.


PSMVIS65863AA

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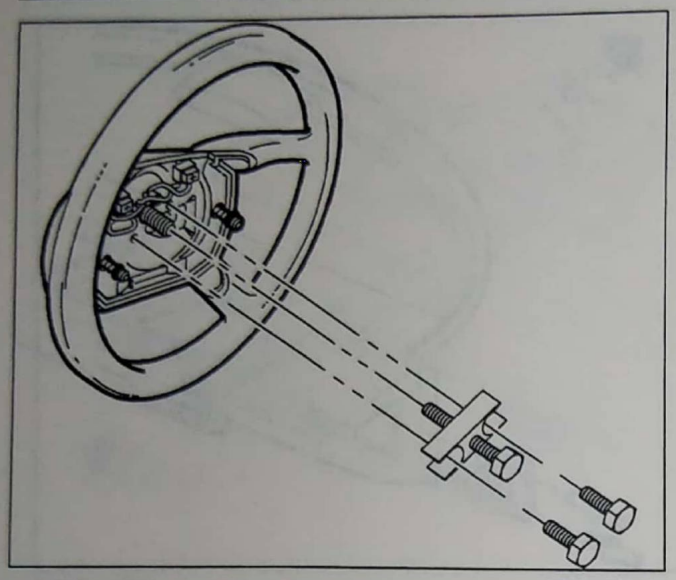
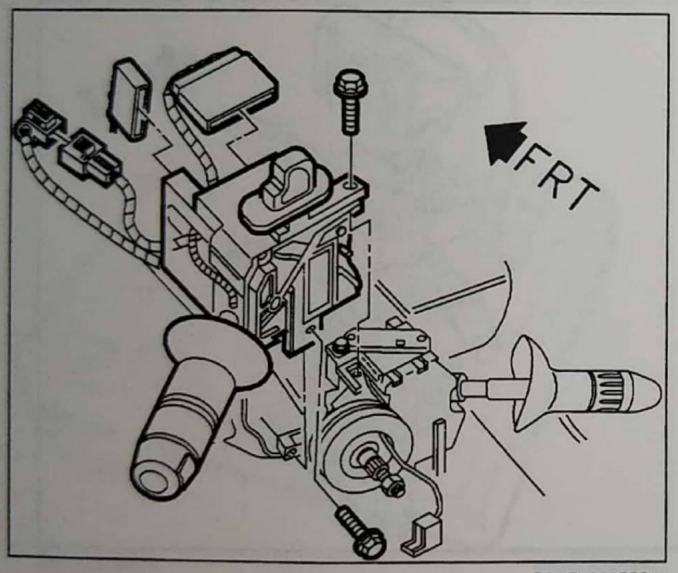


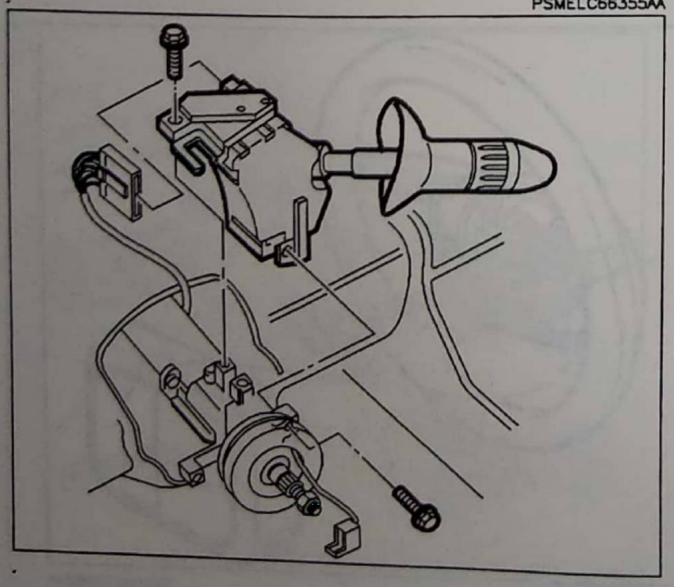
PSMV1S65862M

25. Disconnect horn switch connector.
26. Remove nut from steering column that retains steering wheel.
27. Install steering wheel puller SA9218NE and remove steering wheel.



PSMELC66355AA

28. Remove screws from turn signal, headlamp, and cruise switch.
29. Remove switch and disconnect switch connectors.



PSMELC66356M

30. Remove screws from windshield washer switch.
31. Disconnect connector and remove switch.

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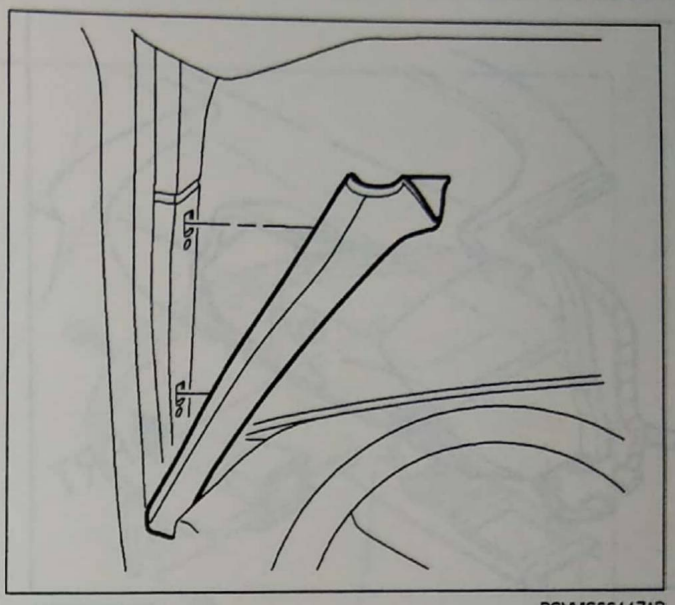
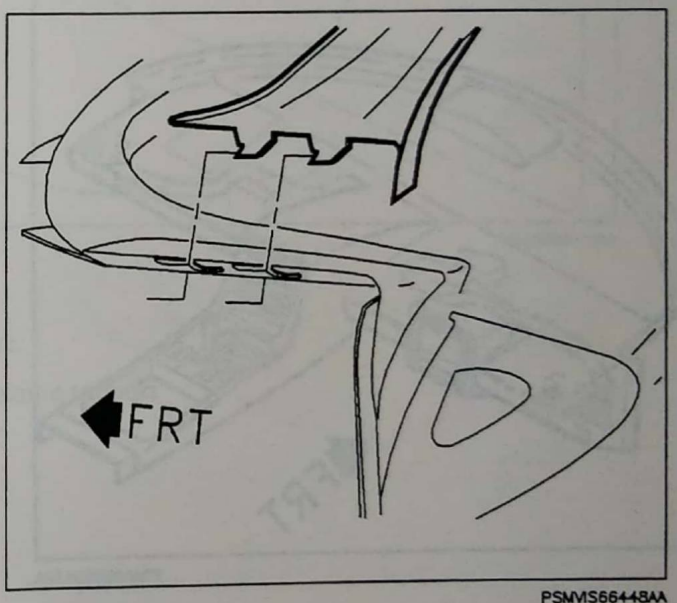
32. Starting at top of garnish molding, pull firmly at clip locations to disengage. Tipping the top of molding inward with the bottom engaged to instrument.



PSMVIS66447AB

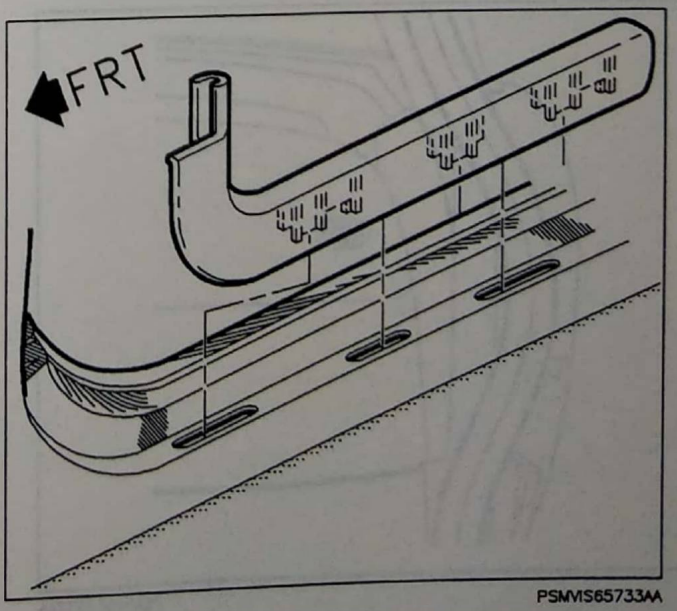
33. Disengage tabs on garnish molding from instrument panel by pulling rearward and inboard.



PSMVIS66448AA

34. Starting at rear of carpet retainer, pull firmly on carpet retainer at clip locations to disengage clips.

35. Remove front side door opening floor carpet retainer.



PSMVIS65733AA

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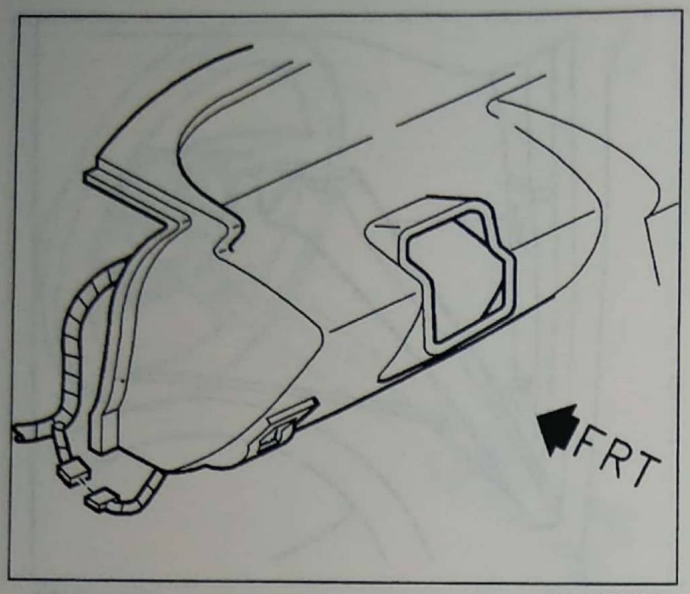
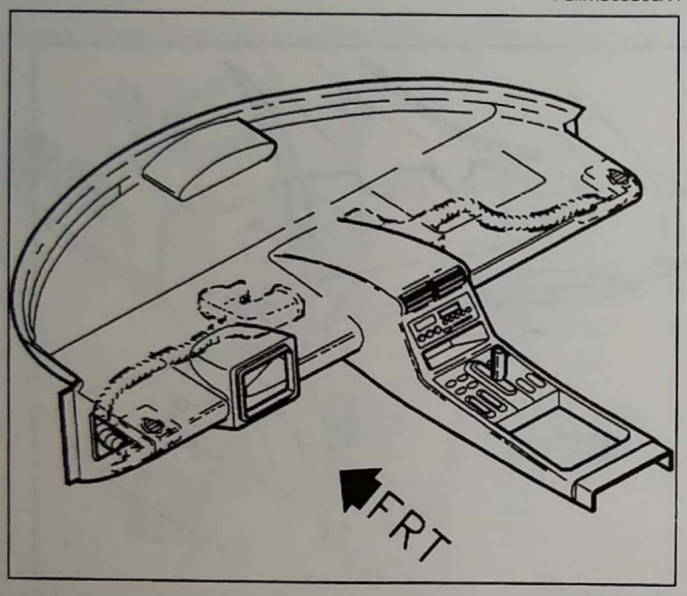


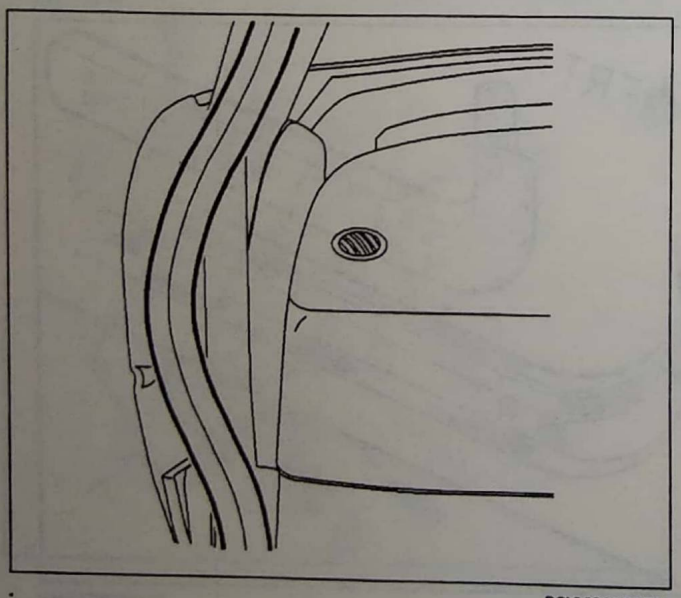
PSMVIS65865AA

36. Disconnect parking brake switch connector.



PSMVIS66047M

37. Disconnect side window demistor tubes from floor outlets.



PSMVIS66337AA

38. Remove side door weatherstrip from pinch weld flange near instrument panel.

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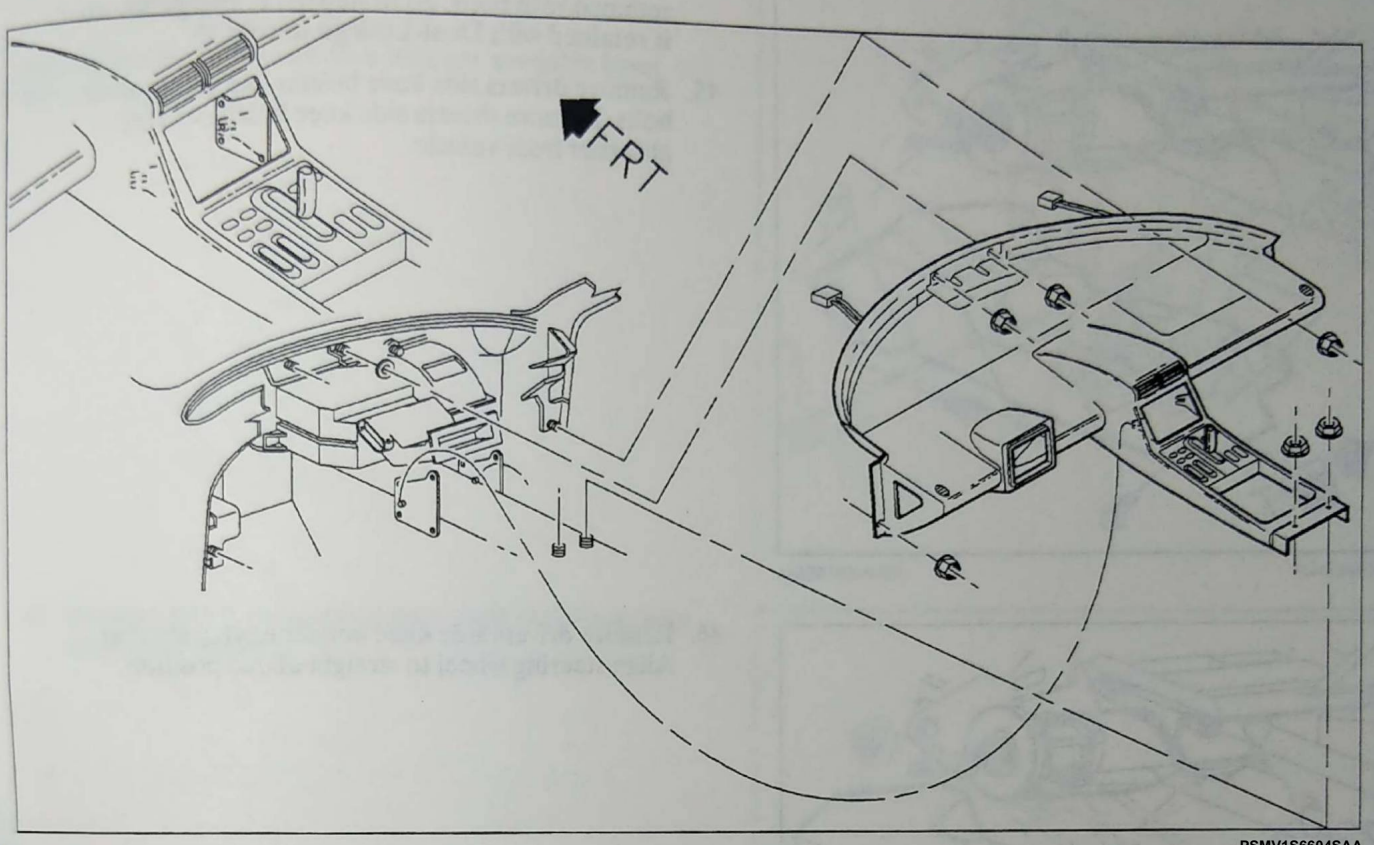

PSMV1S6604SAA

39. Remove retainers from instrument panel.
40. Pull instrument panel rearward with slight upward pressure.
41. Pull driver's side demister tube through hole in steering column support
42. Disconnect both information telltale connectors.
43. Remove instrument panel from vehicle.

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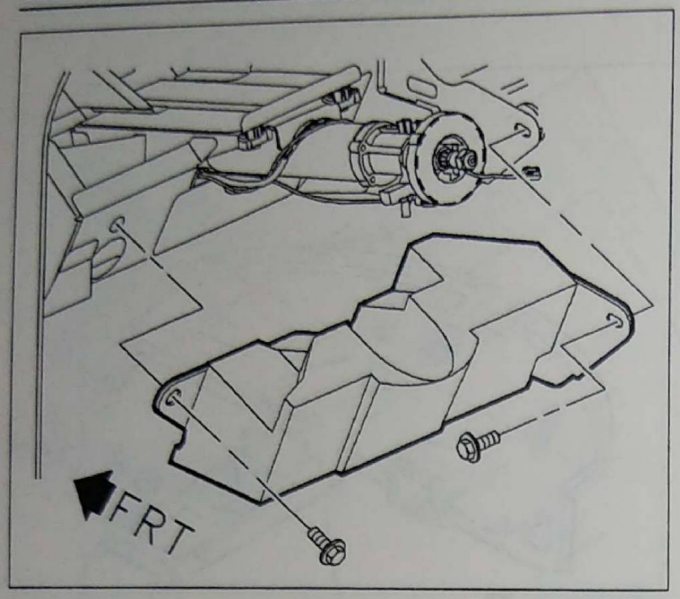
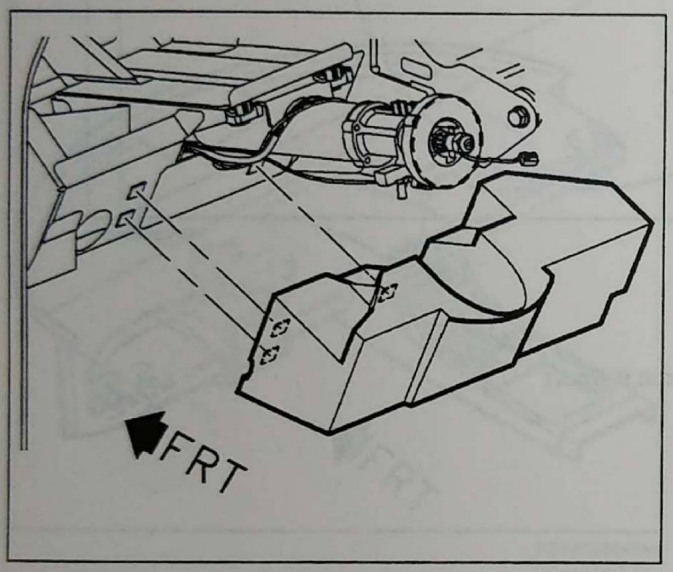


PSMVIS67898AA

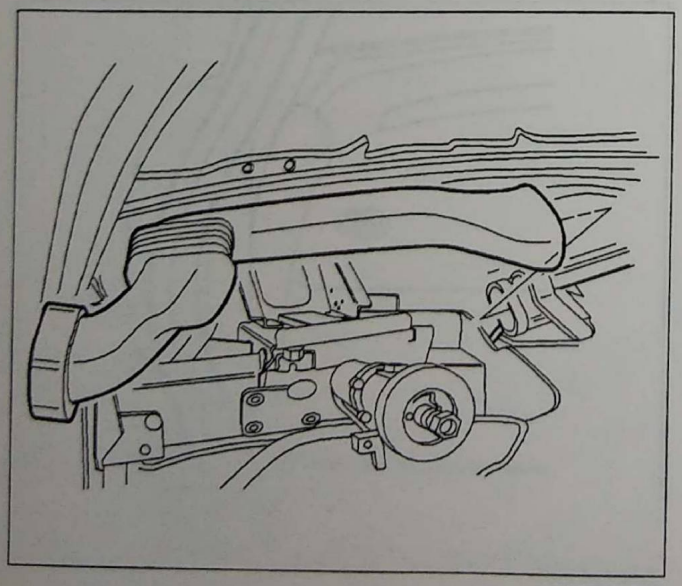
44. If Driver side knee bolster energy absorber is retained with bolts, go to step 45. If energy absorber is retained with Dual-Lock go to step 46.

45. Remove drivers side knee bolster energy absorber bolts. Remove drivers side knee bolster energy absorber from vehicle.



PSMVIS66338AA

46. Remove drivers side knee bolster energy absober. Align steering wheel to straight ahead position



PSMVIS66336AA

47. Remove drivers side outer air duct.

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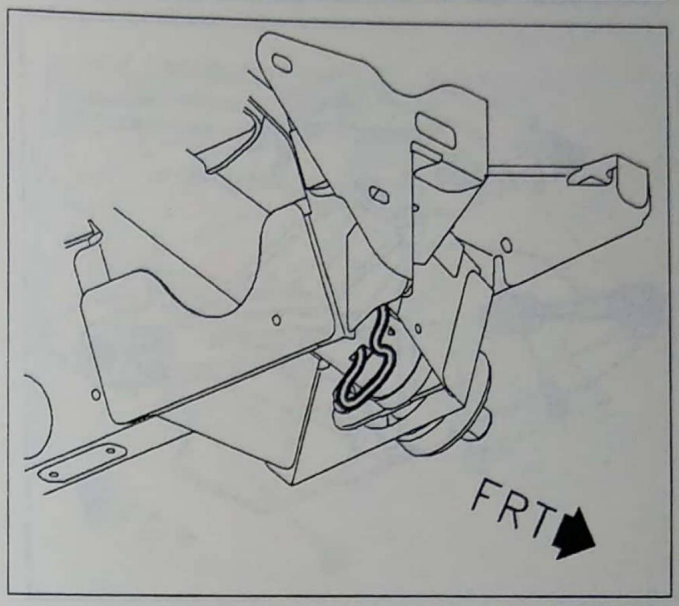
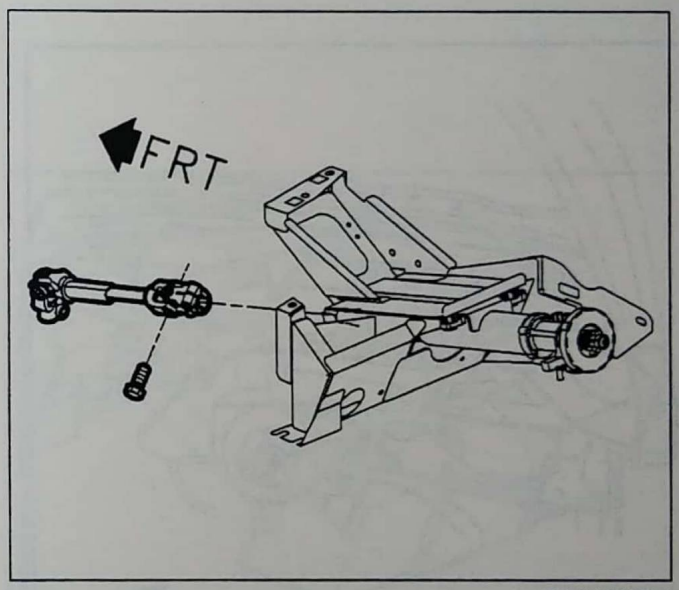
48. Install steering column anti-rotation clip in to base of column shaft.

IMPORTANT: Anti-rotation clips are available from Saturn Service Parts.



PSMV1S66762AA

49. Remove bolt from intermediate shaft and disconnect shaft from column.



PSMVIS66790AA

50. Remove bolts and nuts that retain steering column to steering column support. Remove steering column from vehicle.

INSTALLATION

1- Load steering column into steering column support aligning studs on support to base of steering column.

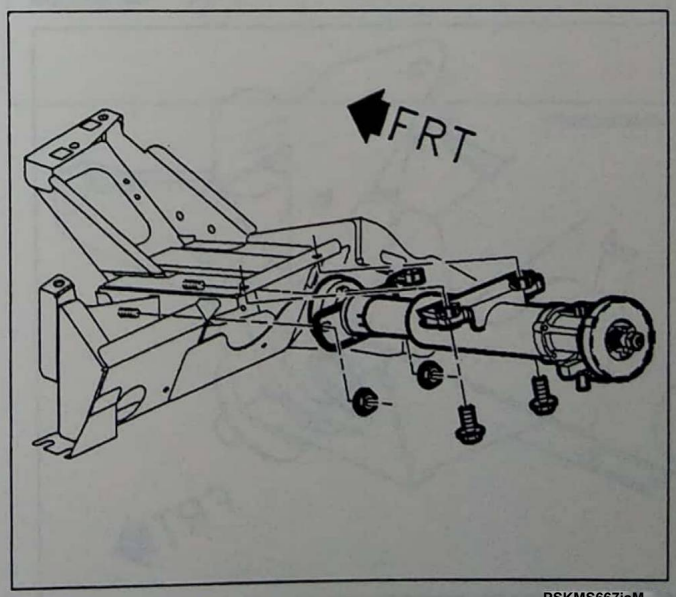
2. Start bolts at upper mount of steering column and hand tighten.

L Install nuts at base of steering column.

Torque: 25 N«m (19 ft—lbs)

4- Tighten bolts at upper mount of steering column.

Torque: 25 N-m (19 ft-lbs)



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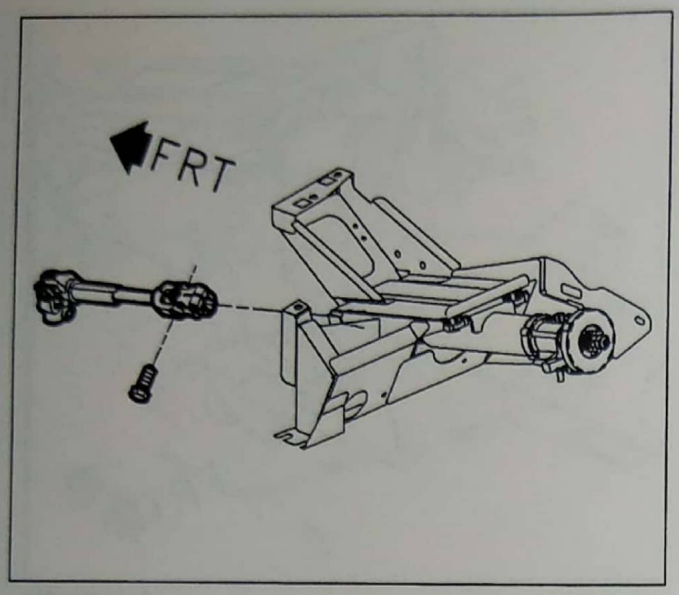
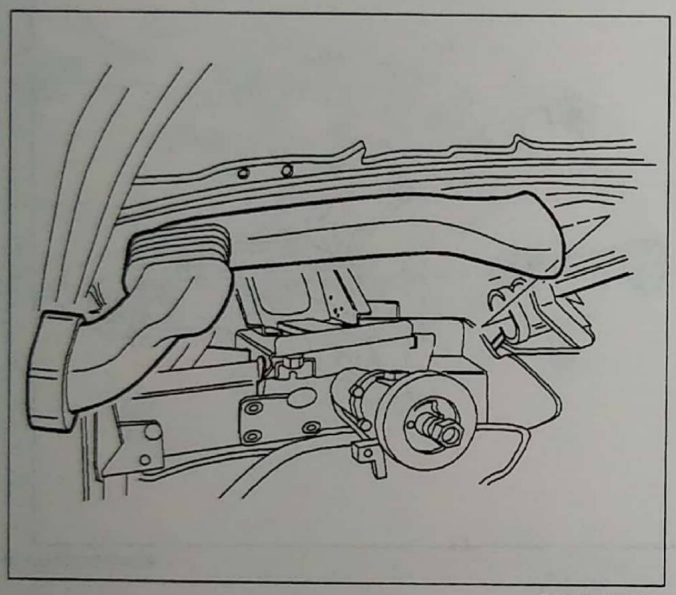


PSMVIS66790AA

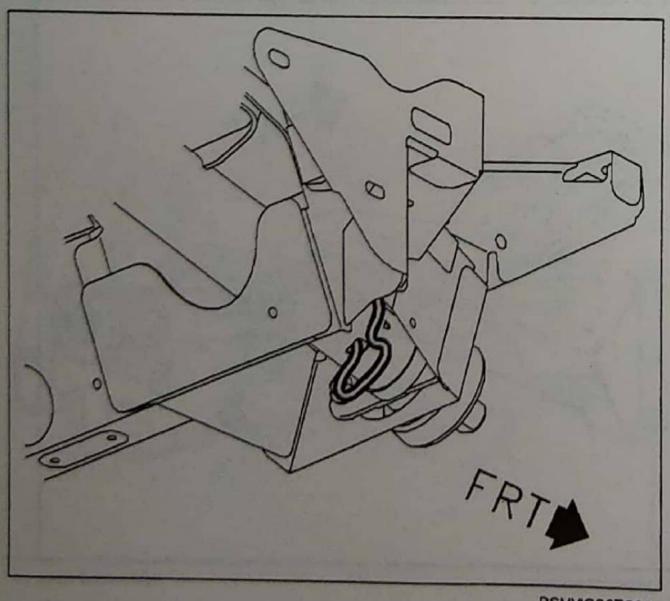
5. Fit intermediate shaft to splined end of steering column and install bolt to intermediate shaft.

Torque: 47 N*m (35 ft—lbs)



PSMVIS66336AA

6. Install driver side outer air duct.



PSMVIS66762AA

7. Remove anti-rotation clip from base of steering column.

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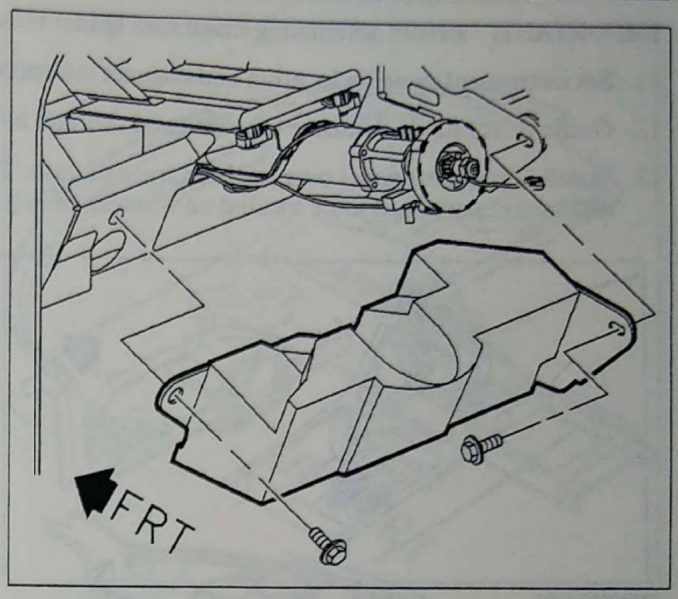
8. If drivers side knee bolster energy absorber is retained with bolts, go to step 9. If energy absorber i is retained with Dual-Lock, go to step 10.

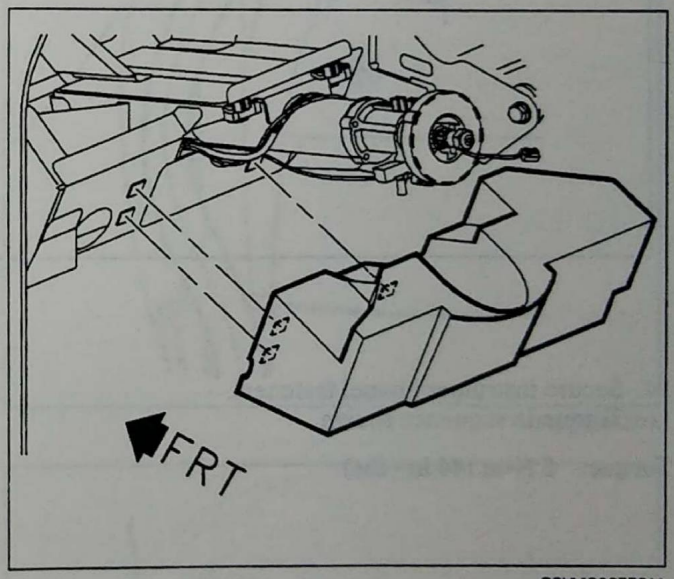
9. Align driver side knee bolster energy absorber and install bolts.

Torque: 25 N*m (19 ft-lbs)



PSMV1S67898M

10. Install driver's side knee bolster energy absorber.



PSMVIS66338AA

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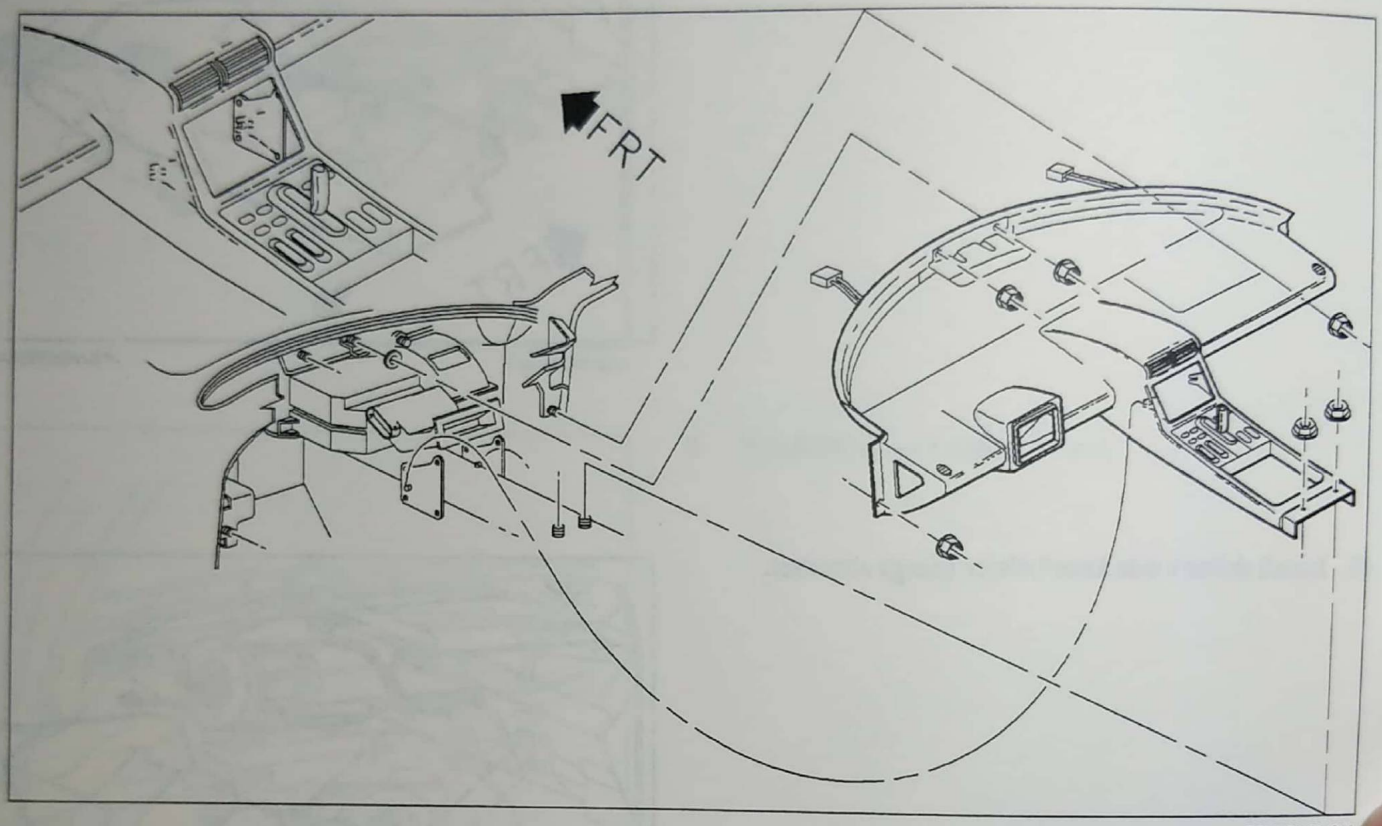
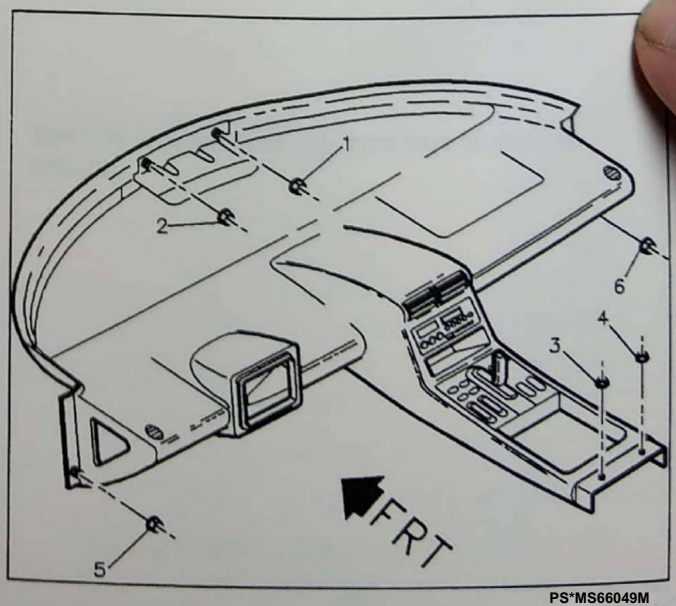
IMPORTANT: Before assembling make sure spacer is in proper location to body. Refer to illustration.

11. Set instrument panel in location and connect information telltale connectors.
12. Guide driver's side demister tube into and through hole in steering column support.
13. Install instrument panel over studs on front of dash. The tunnel has locator pins on either side of which the instrument panel has to be located on when installing.



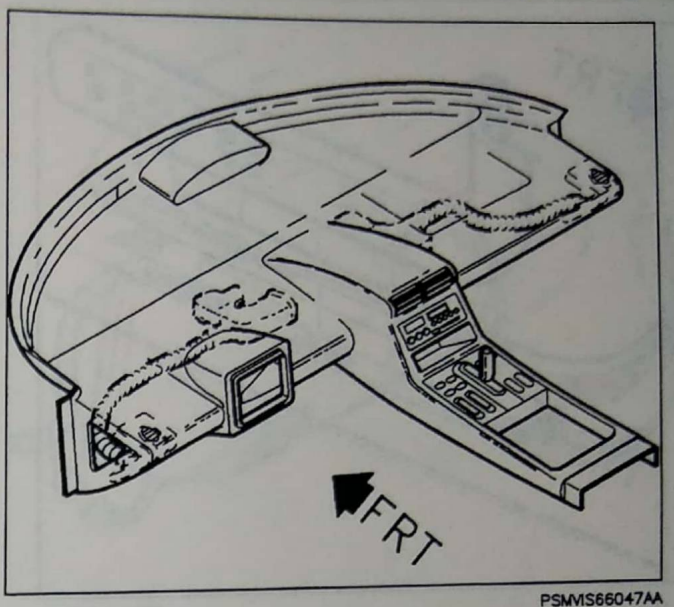
14. Secure instrument panel fasteners. Torque in sequence shown.

Torque: 5 N•m (44 in−lbs)



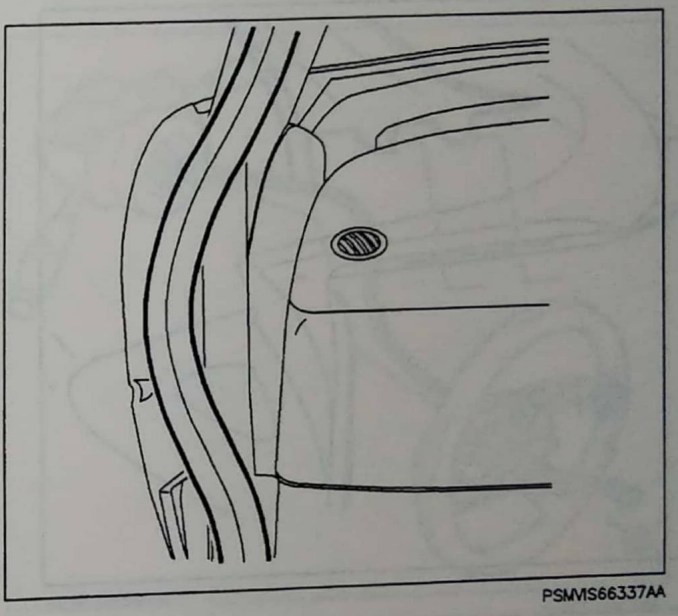
CamScanner

15. Connect side window demister tubes to floor outlets.



PSMIS66047AA

16 Install side door weatherstrip onto pinch weld flange near instrument panel.


PSMIS66337AA

17. Connect connector to windshield washer switch.

18. Install screws retaining switch.

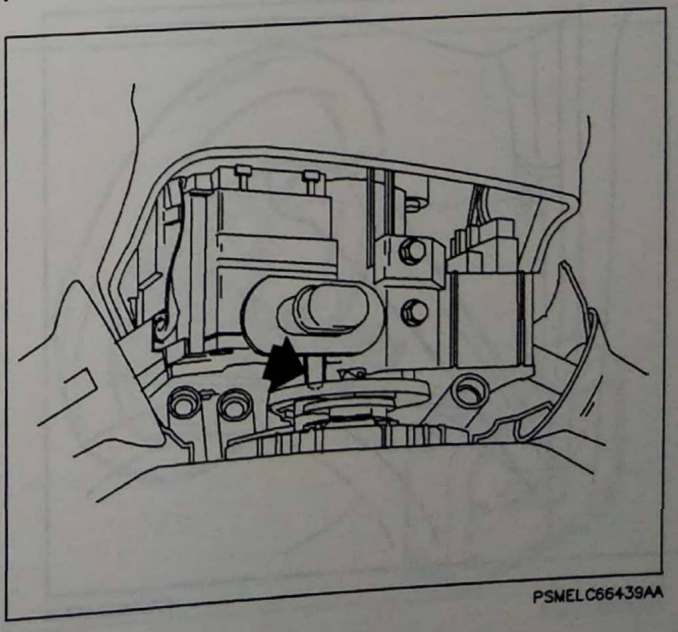
Torque: 2.5 N*m (22 in-lbs)

19. Connect connectors to turn signal, headlamp, and cruise switch.

20. Place switch in position, being careful that the pin is positioned correctly against the ring on the back of the turn signal cancel cam assembly.

21- Install screws retaining switch.

Torque: 2.5 N«m (22 in—lbs)


PSMELC66439AA

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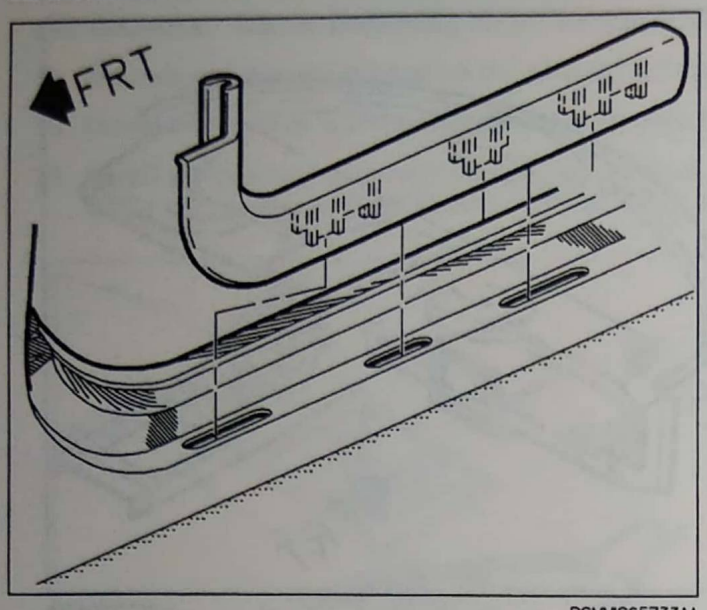
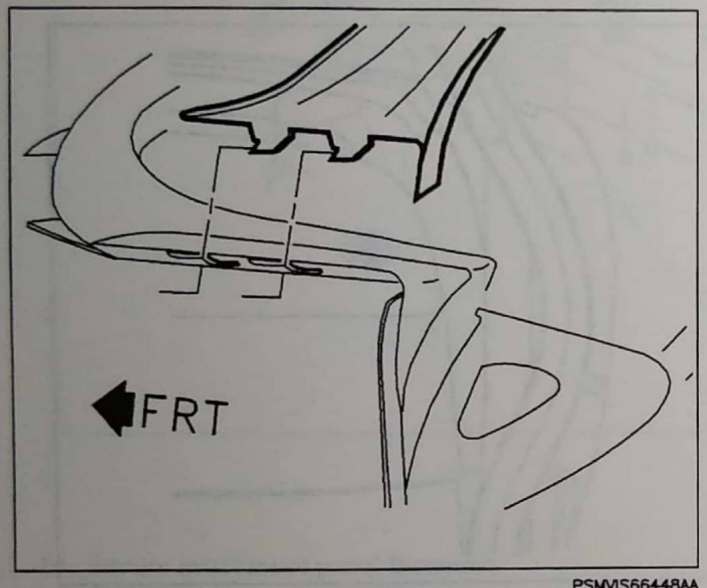


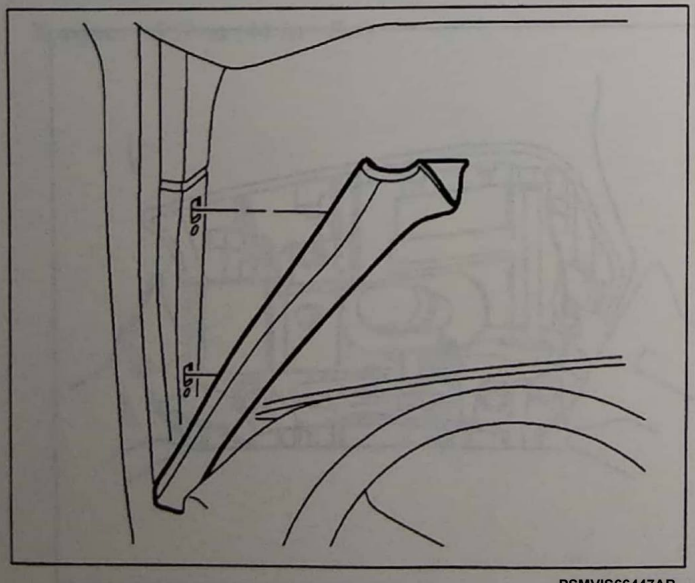
PSMVIS65733AA

22. Locate carpet retainer to door opening.
23. Firmly seat carpet retainer into weather.
24. Snap clips into slots in inner rocker pan.



PSMVIS66448AA

25. Insert tabs on bottom of garnish molding into instrument panel.
26. Push molding downward and forward past A-pillar structure.



PSMVIS66447AB

27. Push molding to structure pressing forward and outward to insure proper fit to instrument panel, headlining and door seal.
28. Align clips on garnish molding to slots in A-pillar and press firmly at clip locations.
29. Position flap on door weatherstrip over windshield garnish molding.

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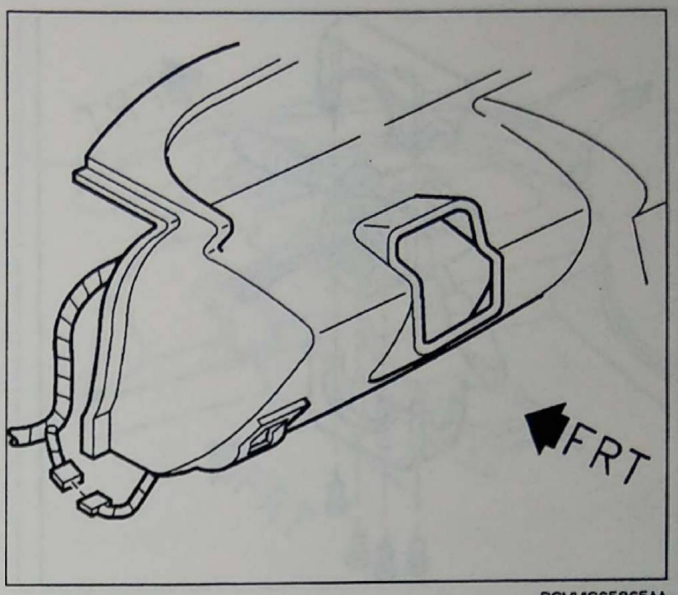
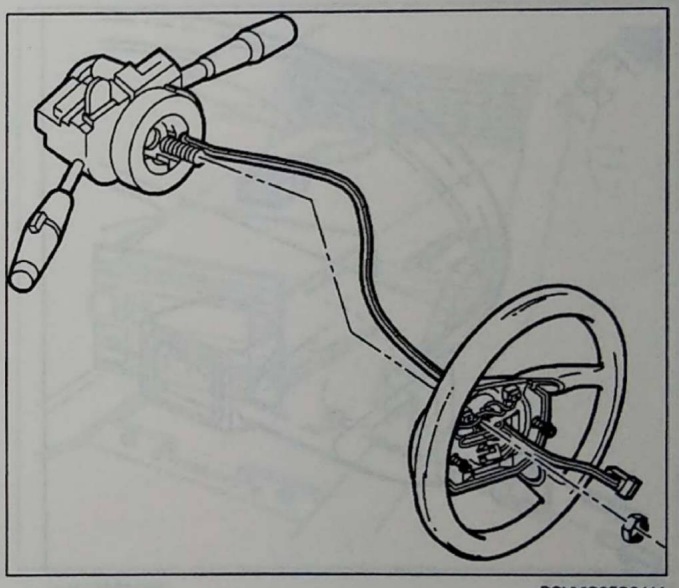
30. Connect park brake switch connector.



PSMVIS65865AA

31. Route SIR cable through steering wheel. Install steering wheel to column.
32. Connect horn wire connector.
33. Install steering wheel nut.

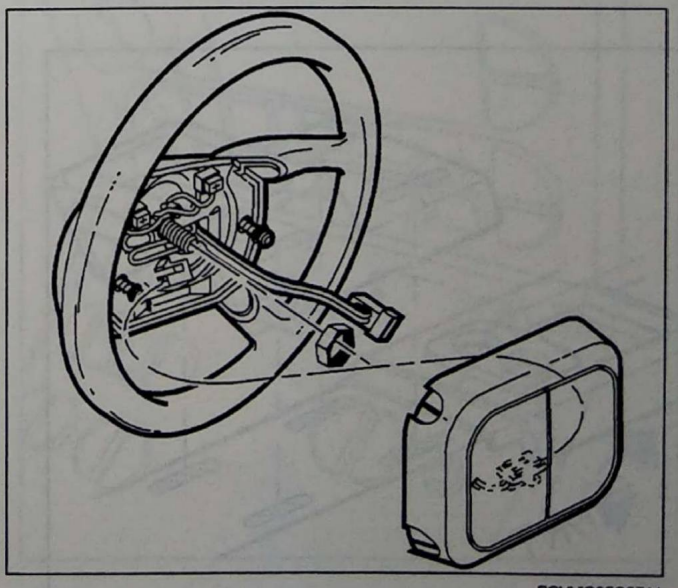
Torque: 42 N*m (31 ft—lbs)



PSMVIS65864AA

34. Route yellow SIR inflator module wire harness within the steering wheel hub forming an “S” shape with wire and connect SIR inflator module connector.
35. Install CPA, to connector.
36. Install inflator module to steering wheel.

Torque: 10 N-m (89in-lbs)



PSMVIS65863AA

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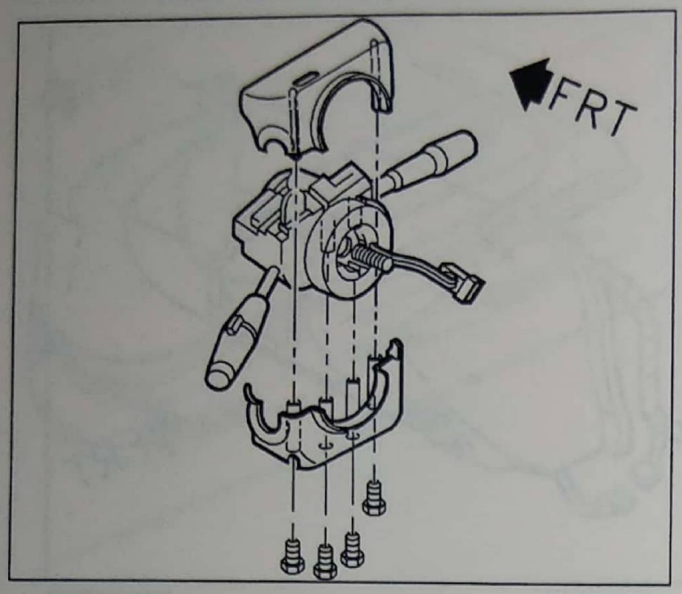
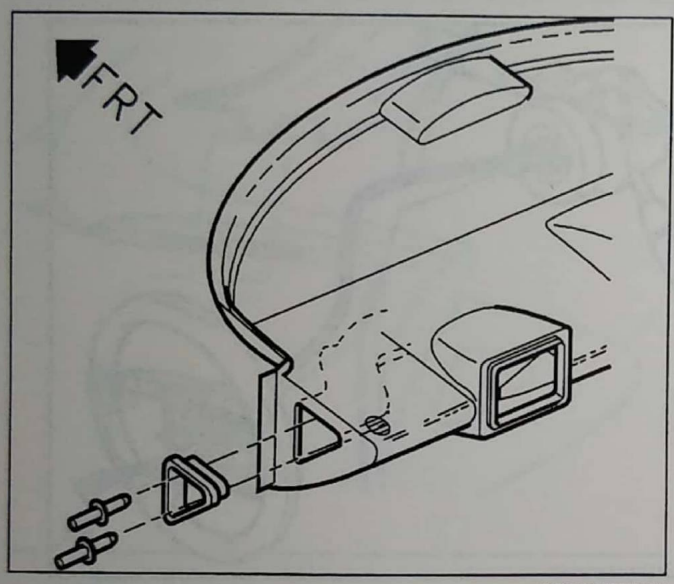


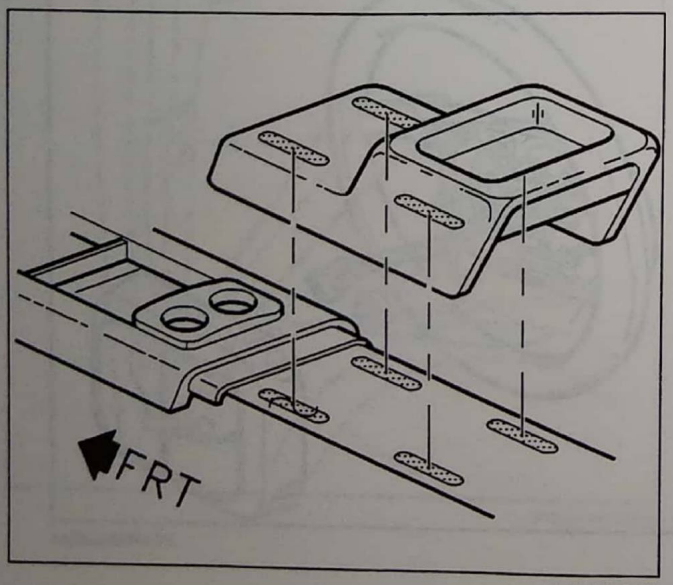
PSMV1S65S27AA

37. Align lower steering column trim cover to steering column. Install and tighten inner screws.
38. AJign upper steering column trim panel to steering column and install outer screws in lower steering column trim panel. Tighten outer screws.



PSMVIS65736AA

39. Install left and right front side door air outlets on side of the instrument panel using new fasteners.



PSMVIS65735AA

40. Install arm rest

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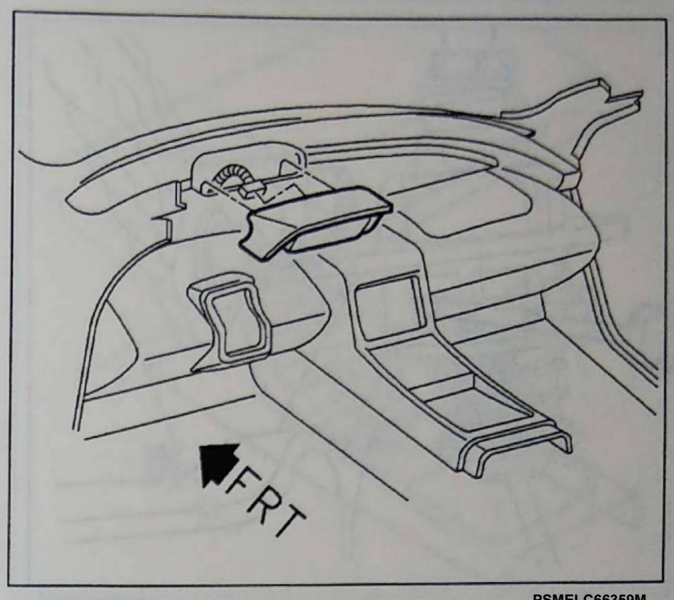
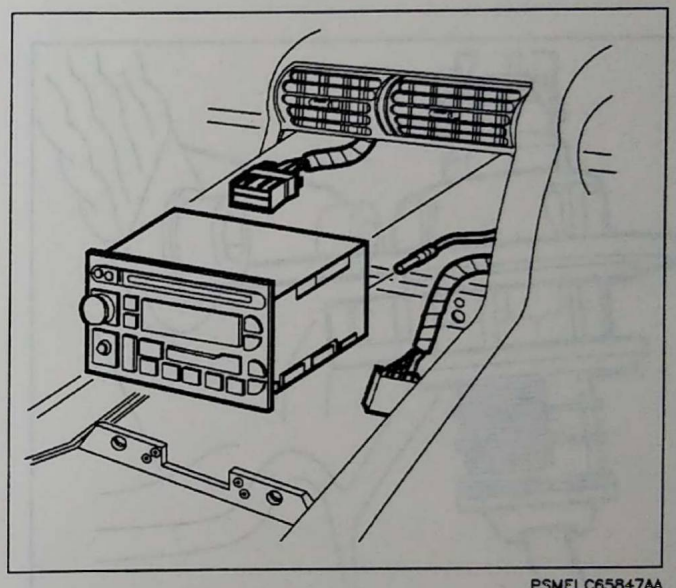
41. Push harness connector into socket on instrument panel cluster. Verify connection is made, seated and locked.
42. Install instrument panel cluster into instrument panel by pushing forward and downward.



PSMELC66359M

43. Connect radio harness to radio, then antenna lead to radio. Verify both connections are seated properly.
44. Make sure antenna and harness are up and out of the way of the radio bracket. Slide radio into opening until the radio is seated and the radio fits tightly to the console. You may hear a click as the radio tab locks into the bracket.


PSMELC65847AA

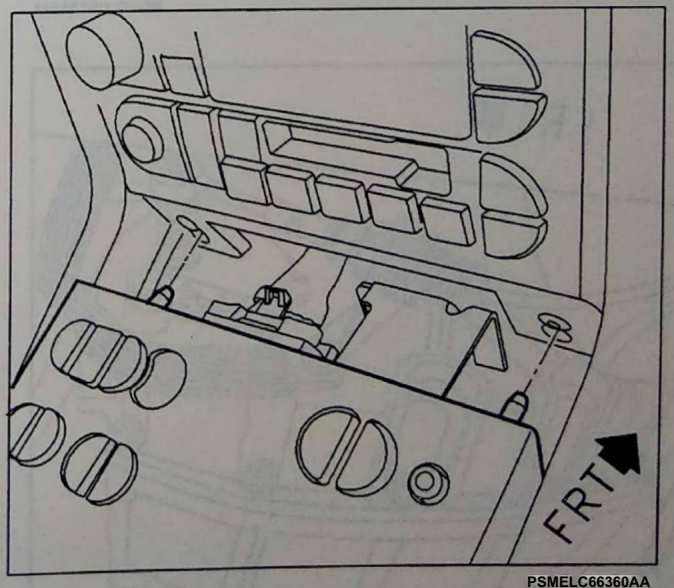
45. Cover the radio face with a rag for protection during RSA installation. Install shift cable housing into shift bracket and connect and secure shift cable to shifter. Be sure clip lock tab is in place.
46. Connect wire harness connector to RSA.
47. Align RSA locator tabs to front of instrument panel and push down on the rear of the RSA.
48. Install fasteners.

Torque: 6 N*m (53 in-lbs)

IMPORTANT: You must adjust shift cable at final drive unit.

49. Adjust shift cable:

IMPORTANT: The shift cable must be attached to the RSA with the RSA secured in position. Shift handle must be placed in neutral before cable adjustment is performed.



PSMELC66360AA

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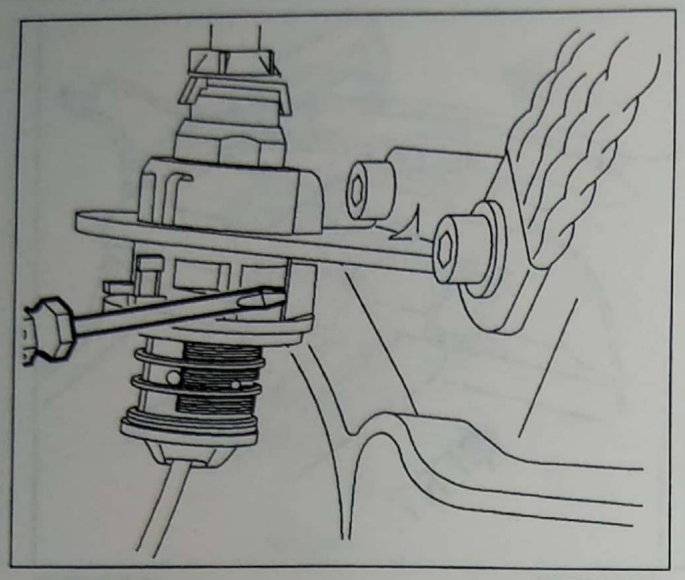
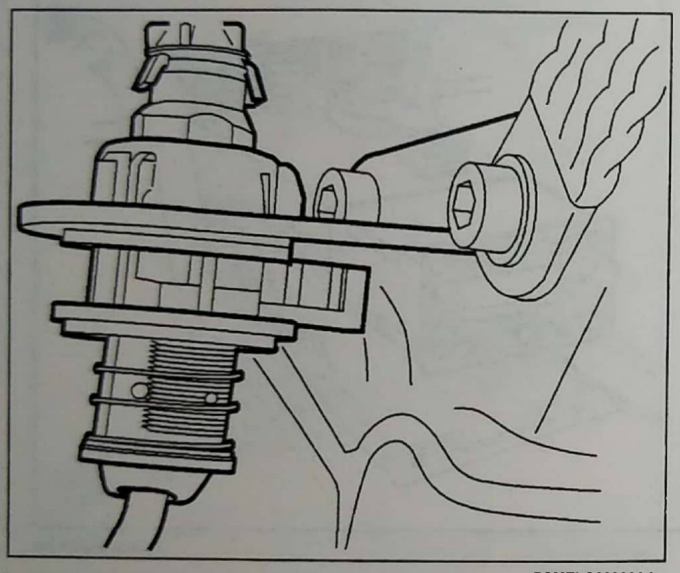


PSMELC66365AA

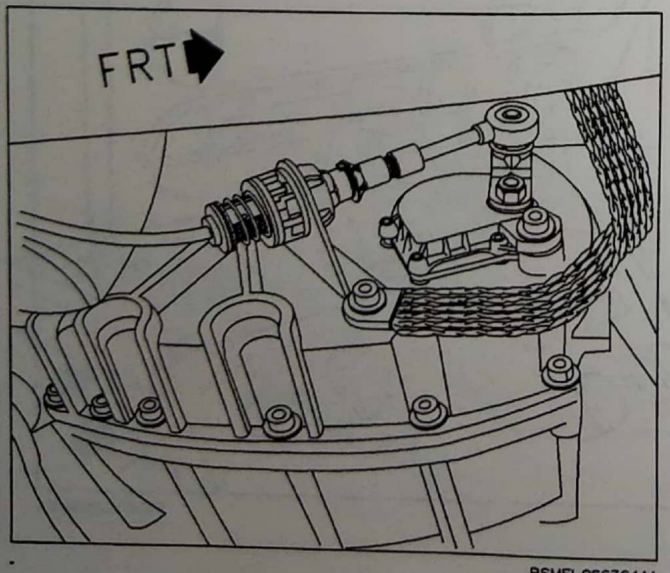
a. Remove underbody front air deflector assembly. (Refer to "Underbody Front Air Deflector Assembly" in the "Body/Repair Service Manual.")

b. Unlock U-shaped adjustment collar. Collar is located aft of drive unit bracket, and will unlock by inserting a pocket screwdriver into gap and prying towards drive unit.



PSMELC66366AA

IMPORTANT: About 13mm (1/2 in.) movement necessary to insure unlock position.



PSMELC66364AA

c. Verify shift lever is in neutral. Push U-shaped collar into lock position. Collar will move to right side of vehicle.

d. By hand shift park/lock lever to the full counterclockwise position (DRIVE) then move one detent in the clockwise direction (NEUTRAL).

e. Install underbody front air deflector assembly. (Refer to "Underbody Front Air Deflector Assembly" in the "Body/Repair Service Manual."

NOTICE: If shift cable has been removed more than six times at either end, for any reason, the cable must be replaced.

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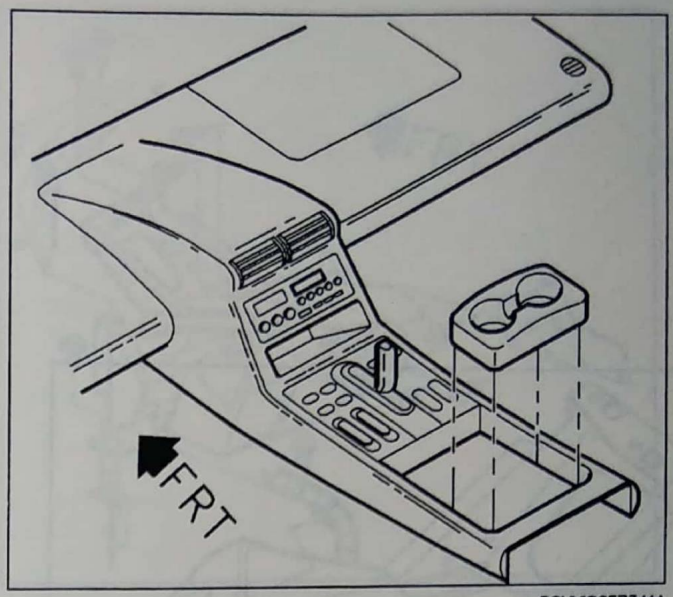
50. Install cup holder to center console.



PSMIS65734AA

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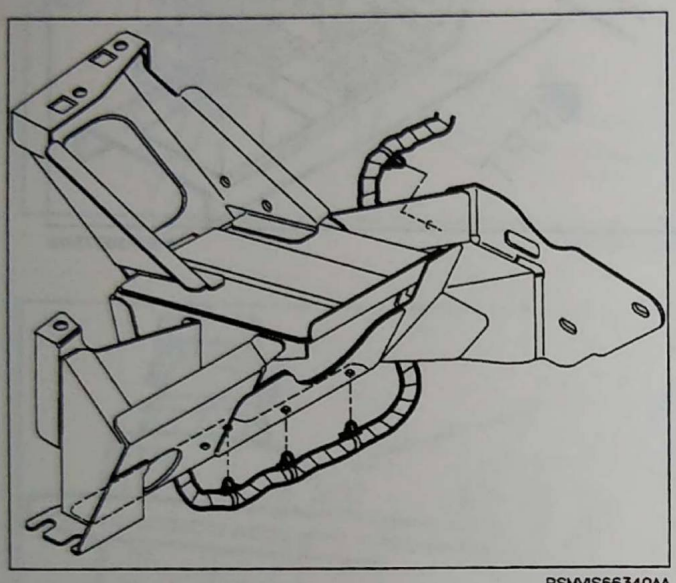
STEERING COLUMN SUPPORT

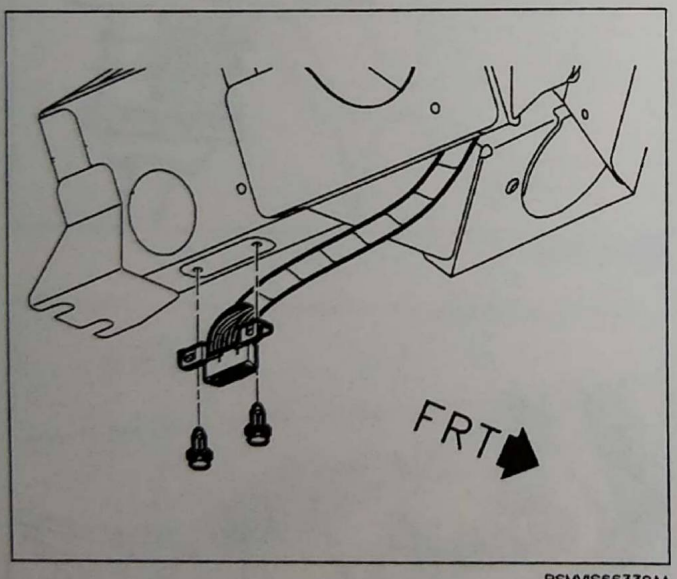
REMOVAL

1. Disable the SIR system. (Refer to “Disabling the SIR System” in this manual.)
2. Remove steering column. (Refer to “Steering Column” removal procedures in this manual.)
3. Unclip wire harness rose buds from steering column support.



PSMVIS66340AA

4. Remove data link connector (DLC) from steering column support.
5. Loosen master cylinder nuts at front of dash.



PSMVIS66339AA

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d Remove bolts and nut from steering column support.

IMPORTANT: Bolts at base of windshield will need to be removed with an open-end wrench.

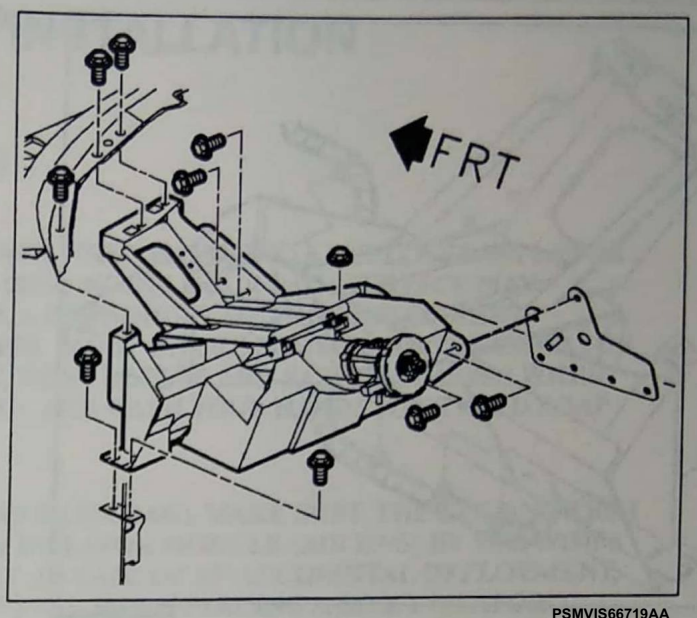
7 Remove steering column support from vehicle.

INSTALLATION

1. Load steering column support into vehicle. Hand tighten bolts and nuts.
2. Tighten master cylinder nuts at front of dash.

Torque: 27 N*m (20 ft—lbs)

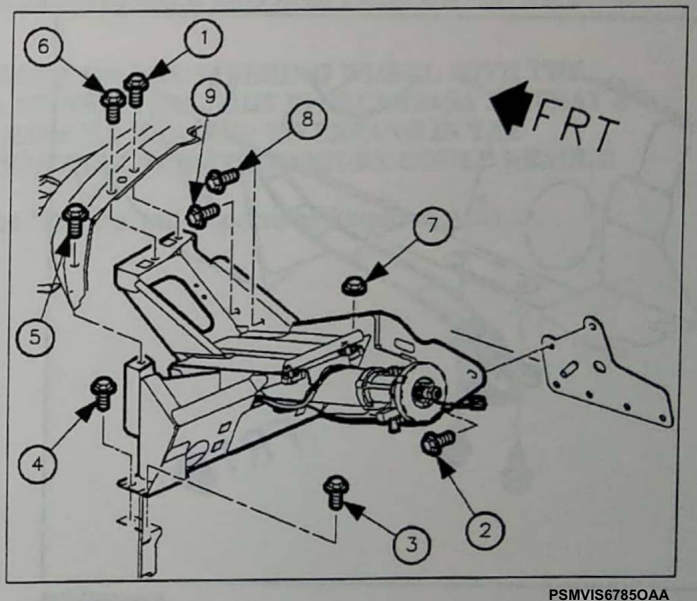
3. If drivers side knee bolster energy absorber is retained with bolts go to step 4 for torque sequence of steering column support. If drivers side knee bolster energy absorber is retained with dual-lock go to step 5 for torque sequence of steering support.



PSMVIS66719AA

4. Tighten steering column support bolts and nut in sequence shown.

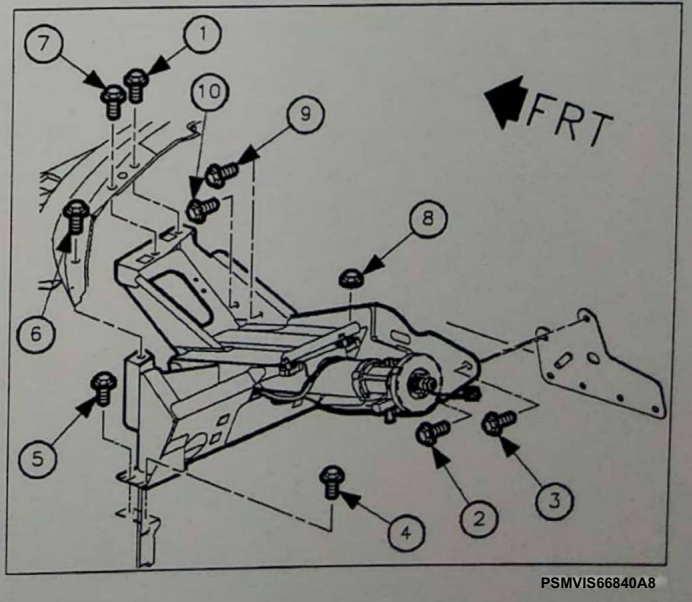
Torque: 25 N*m (19 ft—lbs)



PSMVIS6785OAA

5. Tighten steering column support bolts and nut in sequence shown.

Torque: 25 N*m (19 ft—lbs)



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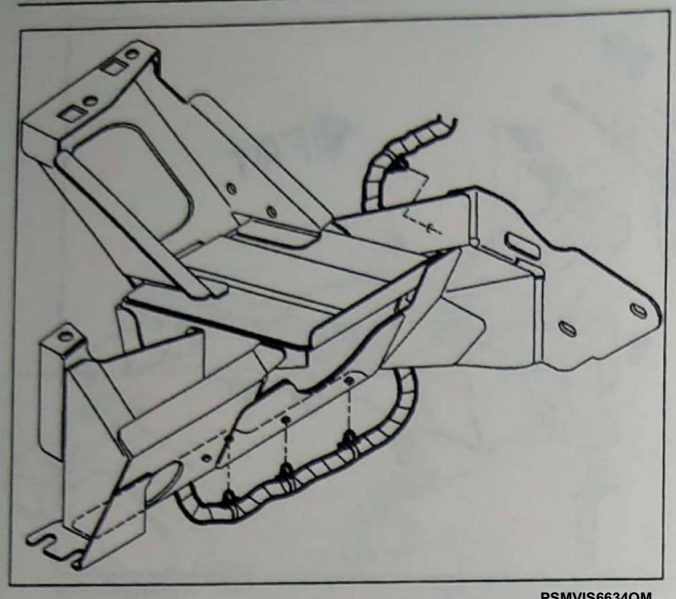
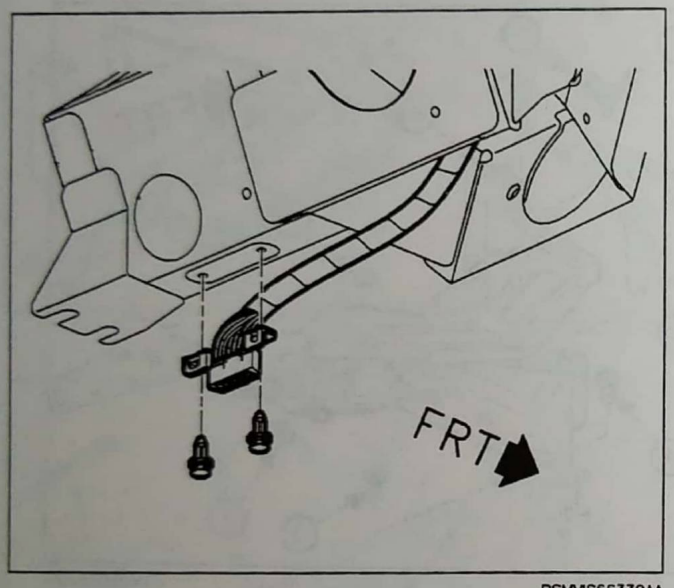


PSMVIS6634OM

6. Route wire harness and insert rose bud into steering column support as shown.



PSMVIS66339AA

7. Install DLC connector to steering column support.
8. Install steering column. (Refer to “Steering Column” installation procedure in this manual.)
9. Enable the SIR system. (Refer to “Enabling the SIR System” in this manual.)

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COMPONENT REMOVAL AND INSTALLATION PROCEDURES

DRIVER INFLATOR MODULE (AIR BAG)

NOTICE: SAFETY PRECAUTIONS MUST BE FOLLOWED WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG). AFTER DEPLOYMENT, THE INFLATOR MODULE (AIR BAG) SURFACE MAY CONTAIN A SMALL AMOUNT OF SODIUM HYDROXIDE, A BY-PRODUCT OF THE DEPLOYMENT REACTION, THAT IS IRRITATING TO THE SKIN AND EYES. MOST OF THE POWDER ON THE INFLATOR MODULE (AIR BAG) IS HARMLESS. AS A PRECAUTION, WEAR GLOVES AND SAFETY GLASSES WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG), AND WASH YOUR HANDS WITH MILD SOAP 4ND W ATER AFTERWARDS.

NOTICE: WHEN CARRYING A LIVE INFLATOR MODULE (AIR BAG), MAKE SURE THE BAG AND TRIM COVER ARE POINTED AWAY FROM YOU. NEVER CARRY INFLATOR MODULE (AIR BAG) BY THE WIRES OR CONNECTOR ON THE UNDERSIDE OF THE MODULE. IN CASE OF AN ACCIDENTAL DEPLOYMENT, THE BAG WILL DEPLOY WITH MINIMAL CHANCE OF INJURY. WHEN PLACING A LIVE INFLATOR MODULE (AIR BAG) ON A BENCH OR OTHER SURFACE, ALWAYS FACE BAG AND TRIM COVER UP, AWAY FROM THE SURFACE.

NOTICE: NEVER REST A STEERING COLUMN ASSEMBLY ON THE STEERING WHEEL WITH THE INFLATOR MODULE (AIR BAG) FACE DOWN AND COLUMN VERTICAL. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE INFLATOR MODULE (AIR BAG) TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY COULD RESULT.

IMPORTANT: In the event deployment has occurred, refer to "Repairs and Inspections Required After an Accident" in the "SIR Service Manual."

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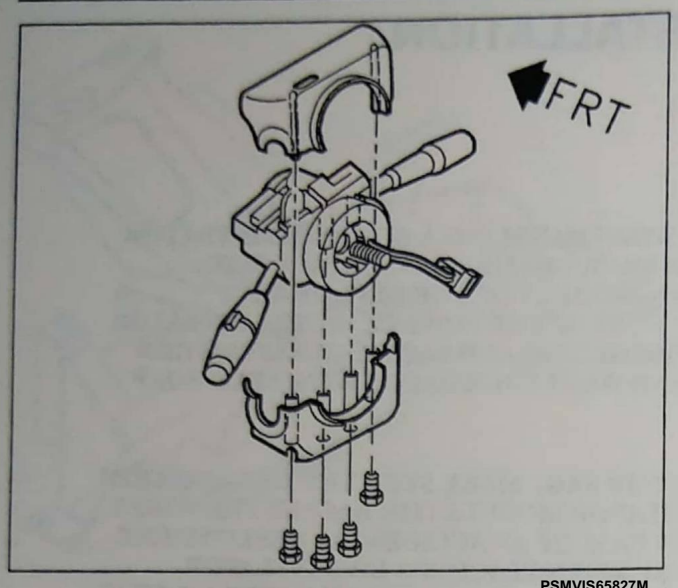
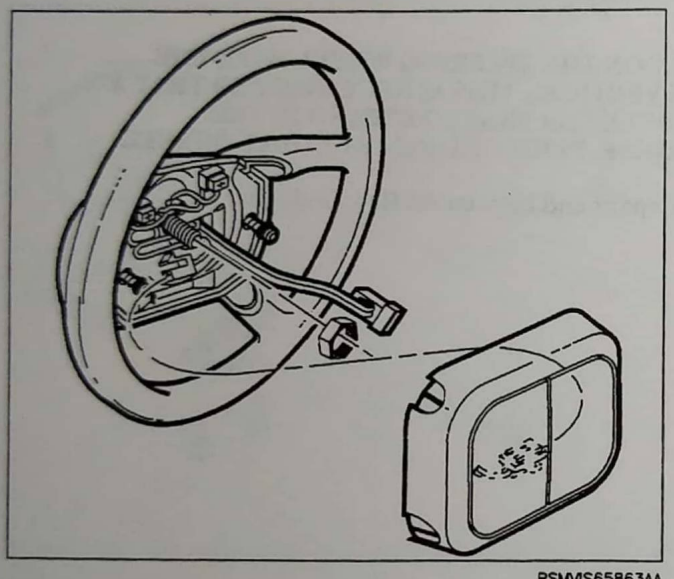
DRIVERS SIDE SIR INFLATOR MODULE



PSMVIS65827M

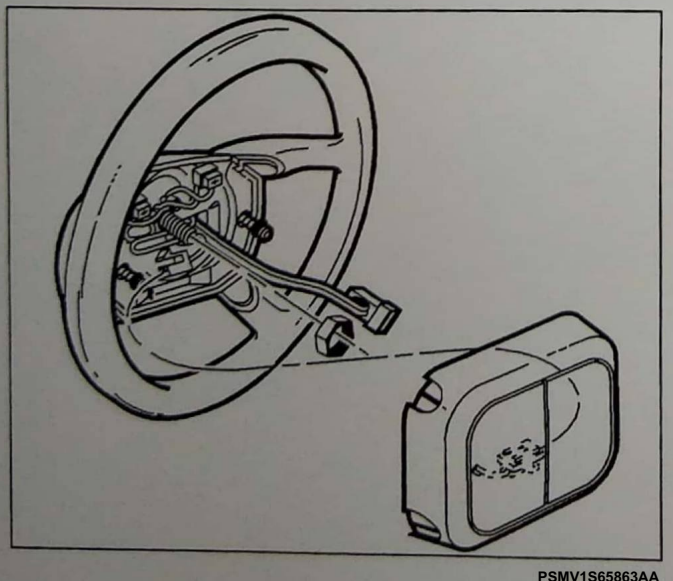
REMOVAL

1. Disable the SIR system. (Refer to "Disabling the SIR System" in this manual.)
2. Remove outer screws from lower steering column trim cover and lift upper trim panel off.
3. Remove inner screws from lower steering column trim cover to remove lower trim cover.



PSMVIS65863AA

4. Remove screws from back of steering wheel which retains the SIR inflator module.
5. Remove the connector position assurance (CPA) from inflator module connector and disconnect the connector. Remove SIR inflator module.



PSMV1S65863AA

INSTALLATION

1. Route yellow SIR inflator module wire harness within the steering wheel hub forming an "S" shape with wire.
2. Connect SIR inflator module connector and install CPA.
3. Install SIR inflator module to steering wheel.

Torque: 10 N*m (89 in-lbs)

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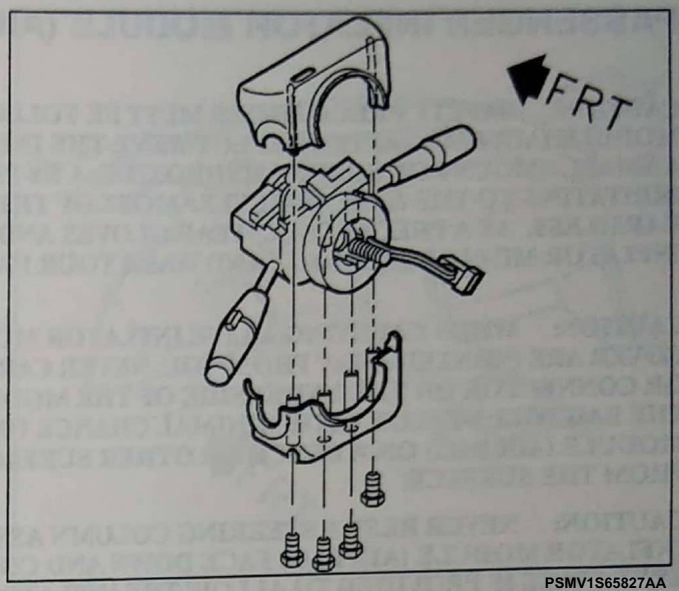
4. Align lower steering column trim cover to steering column and install inner screws.

5. *Align upper steering column* trim panel to steering column and install outer screws in lower steering column trim panel.

6 Enable the SIR system. (Refer to "Enabling the SIR system" in this manual.)



PSMV1S65827AA

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PASSENGER INFLATOR MODULE (AIR BAG)

CAUTION: SAFETY PRECAUTIONS MUST(AIR BAG) SURFACE MAY CONTAIN BE FOLLAWED WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG). AFTER DE^TMENT, TH EINFLM OR MODULE OF THE DEPLOYMJTNT REACTION, THAT IS A SMALL AMOUNT OF SODIUMAT ROXIDE/^BYP ER 0N THE INFLATOR MODULE (AIR BAG) IS IRRITATING TO THE SKIN EYES MOSTOFTHE POWDE AND HANDLING A DEPLOYED K!SMOVUS A ION, WEAR GLOVES AND SAFETY GLASSES WHEN AG), AND WASH YOUR HANDS WITH MILD SOAP AND WATER AFTERWARDS.

CAUTION: WHEN CARRYING A LIVE INFLATOR MODULE (AIR BAG), MAKE SURE THE BAG AND TRIM COVER ARE POINTED AWAY FROM YOU. NEVER CARRY INFLATOR MODULE (AIR BAG) BY THE WIRES OR CONNECTOR ON THE UNDERSIDE OF THE MODULE. IN CASE OF AN ACCIDENTAL DEPLOYMENT, THE BAG MILL DEPLOY WITH MINIMAL CHANCE OF INJURY. WHEN PLACING A LIVE INFLATOR MODULE (AIR BAG) ON A BENCH OR OTHER SURFACE, ALWAYS FACE BAG AND TRIM COVER UR AWAY FROM THE SURFACE.

CAUTION: NEVER REST A STEERING COLUMN ASSEMBLY ON THE STEERING WHEEL WITH THE INFLATOR MODULE (AIR BAG) FACE DOWN AND COLUMN VERTICAL. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE INFLATOR MODULE (AIR BAG) TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY COULD RESULT.

IMPORTANT: In the event deployment has occurred, refer to “Repairs and Inspections Required After an Accident” in the “SIR Service Manual.”

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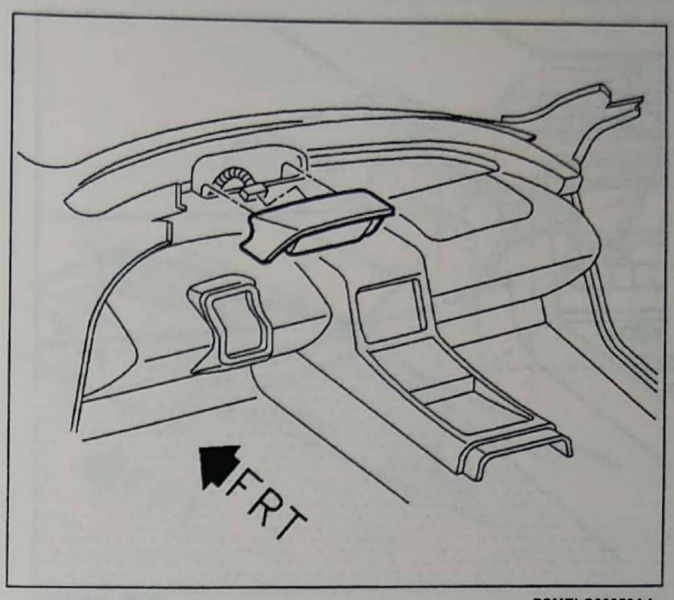
PASSENGER SIDE INFLATOR MODULE AND **INSTRUMENT PANEL** PASSENGER KNEE BOLSTER REINFORCEMENT

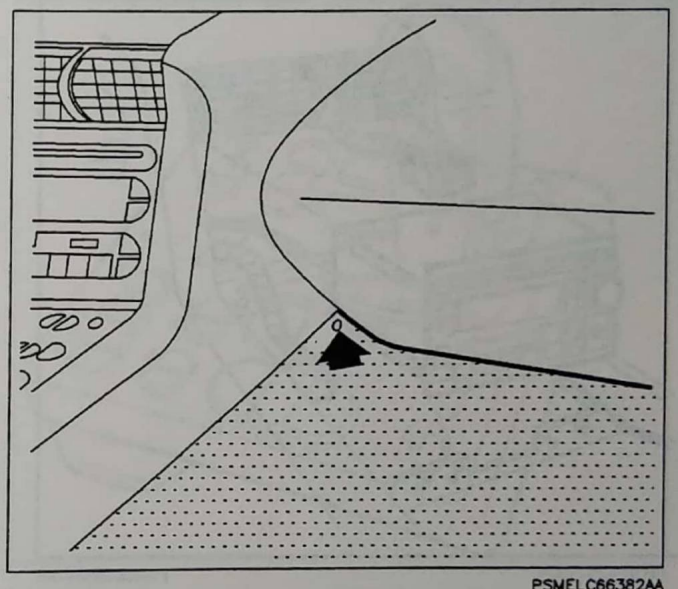
REMOVAL

1. Disable the SIR system. (Refer to “Disabling the SIR System" in this manual.)
2. Remove instrument panel cluster (IPC) by lifting upward and rearward, disconnect the IPC connector.



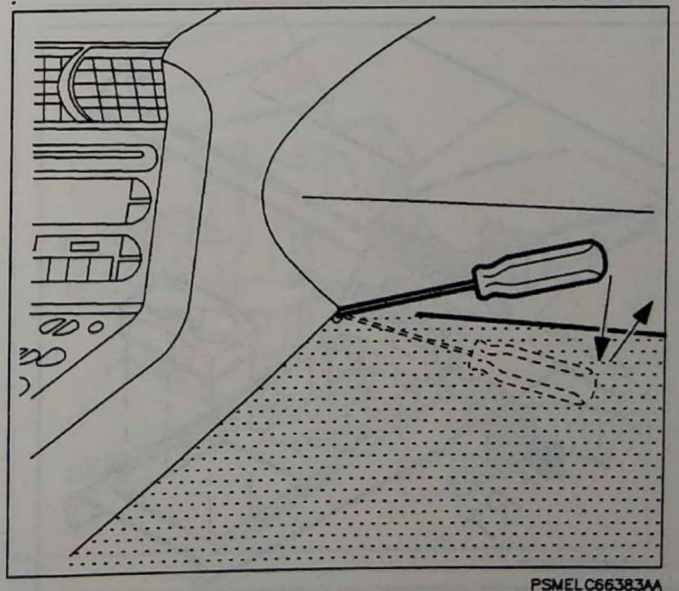
PSMELC66359AA

3. Locate hole in instrument panel tunnel bracket on right side behind carpet.
4. Use a knife to make a small slit in carpet over the hole.



PSMELC66382AA

5. Insert a screwdriver with a blade about 152—304 mm (6 - 12 in.) long into the hole in the instrument panel tunnel bracket. Slide screwdriver along instrument panel radio bracket until the screwdriver is wedged between bracket and the radio lock tab. The screwdriver should be inserted about 152 mm (6 in.).



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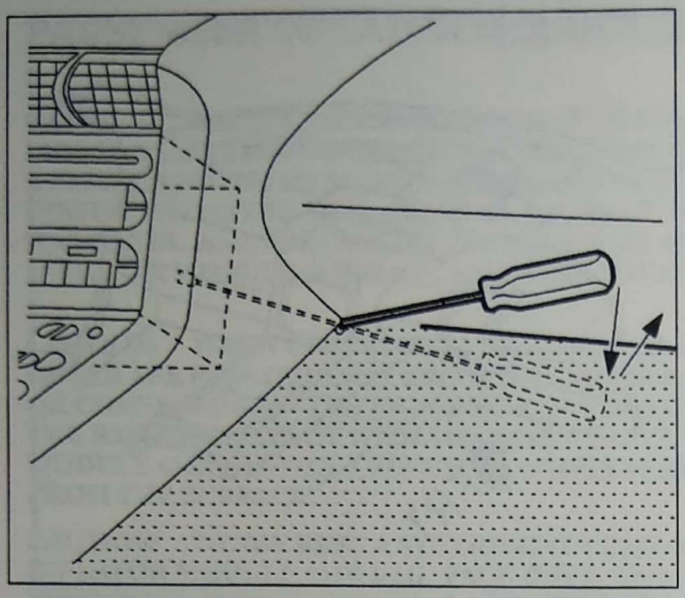
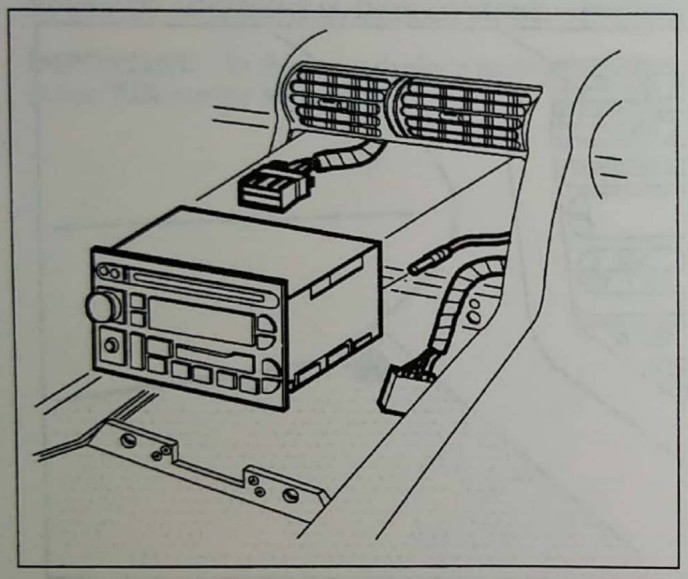


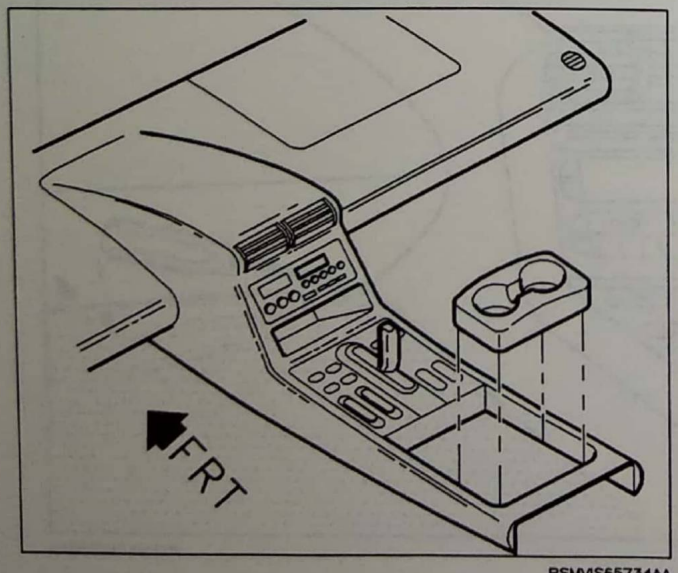
PSMELC66837M

6. Push downward then forward on the screwdriver handle, lifting the lock tab upward and the radio rearward simultaneously. The radio should move rearward enough so that it can be pulled out the rest of the way by hand.
7. With the brake applied, shift run/lock shift assembly (RSA) to DRIVE, then select ACCY mode to shut Off power and apply the parking brake to keep the vehicle from rolling unexpectedly.
8. Lay a clean shop rag over the RSA to help protect it from getting scratched by the radio case during radio removal.
9. Slide radio out of instrument panel.



PSMELC65847AA

10. Disconnect the antenna lead first, then the harness connector.
11. With the brake applied, select the RUN mode again, and shift back to PARK. Then select the LOCK mode to turn the vehicle Off.



PSMMS65734AA

12. Remove cup holder.

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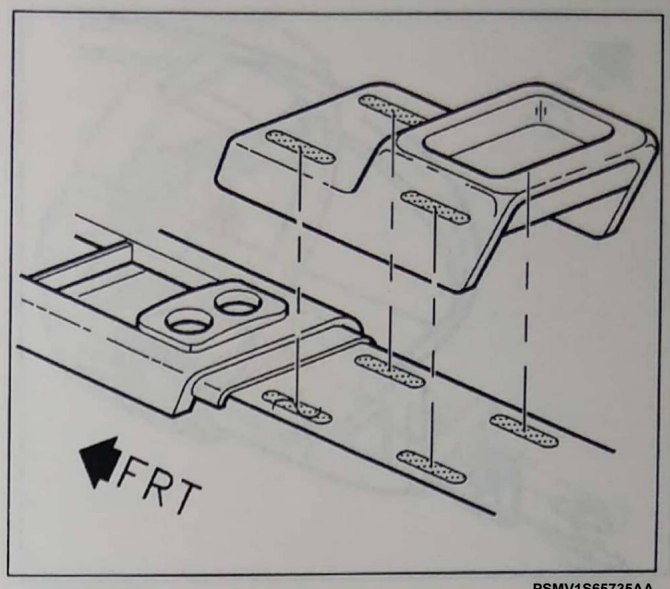
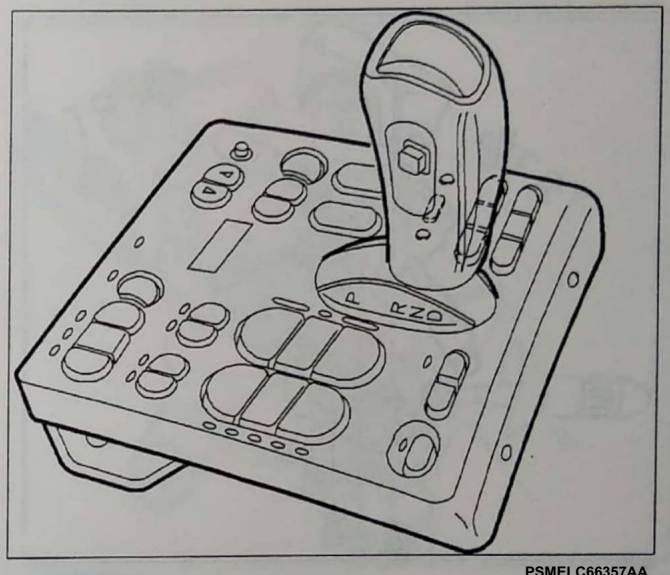
13. Remove arm rest from tunnel by lifting upward releasing Dual-Lock retainers.



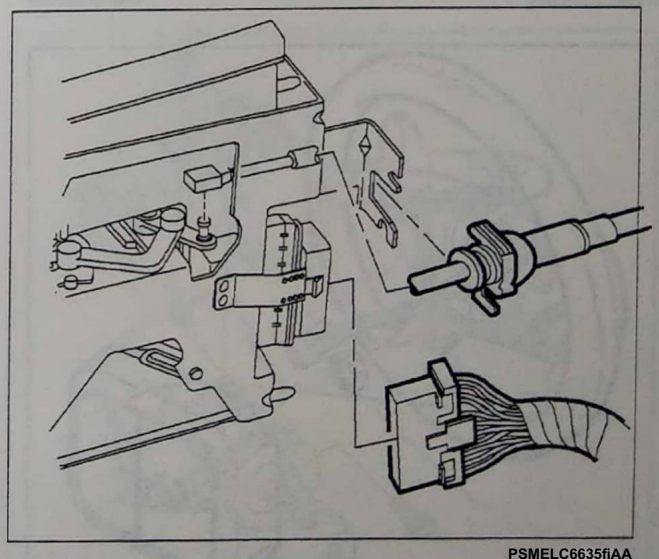
PSMV1S65735AA

14. Remove the screws in the rear of the RS A, pull RSA rearward about 63 mm (2.5 in.).



PSMELC66357AA

15. Rotate RSA towards the drivers side of the vehicle to a 45 degree angle.
16. Disconnect the RSA wire harness connector.
17. Disconnect the shift cable from the shifter and remove shift cable from retainer bracket by prying locking tab on drivers side of RSA gently and pushing cable down out of bracket.



PSMELC6635fiAA

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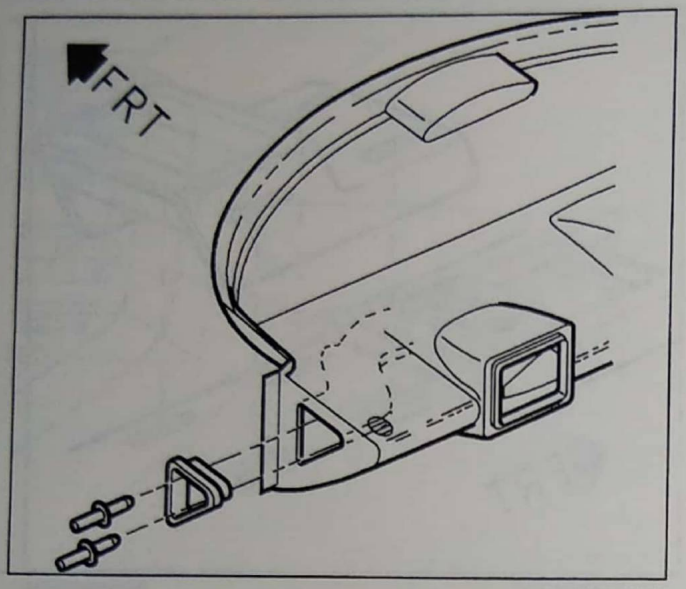
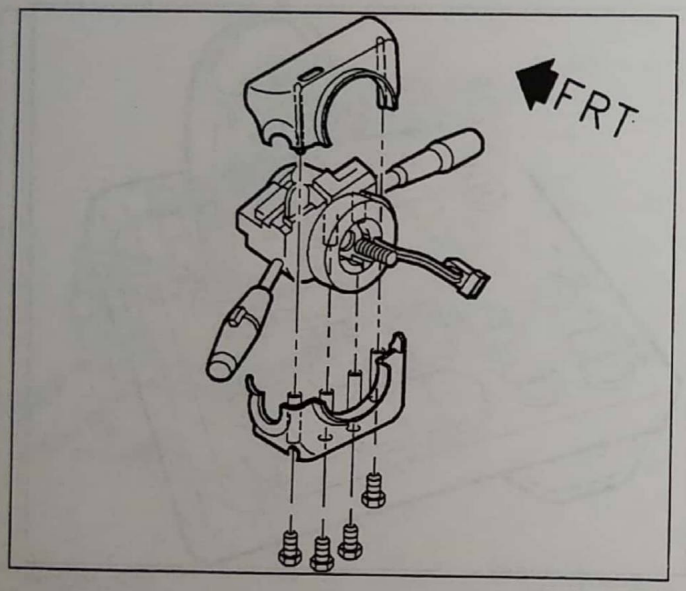


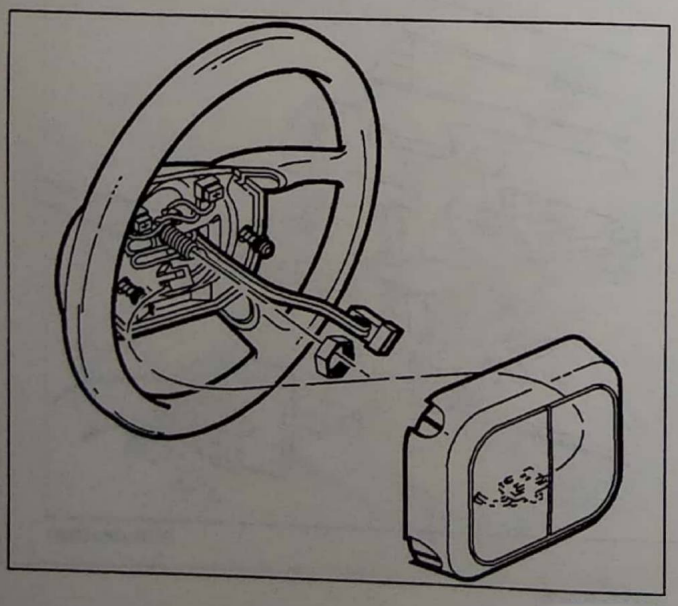
PSMVIS65736AA

18. Drill out rivets from side door air outlets.
19. Remove left and right front side door air outlets on the side of instrument panel with doors open.



PSMVIS65827M

20. Remove outer screws from lower steering column trim cover, left upper trim panel off.
21. Remove inner screws from lower steering column trim cover and remove lower trim cover.



PSMVIS65863M

22. Remove screws from back of steering wheel that retains SIR inflator module.
23. Disconnect SIR inflator module connector
24. Remove SIR inflator module.

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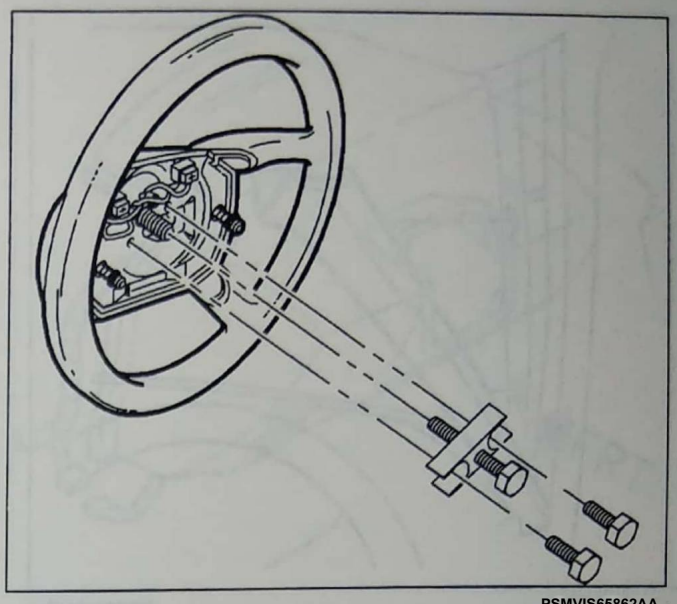
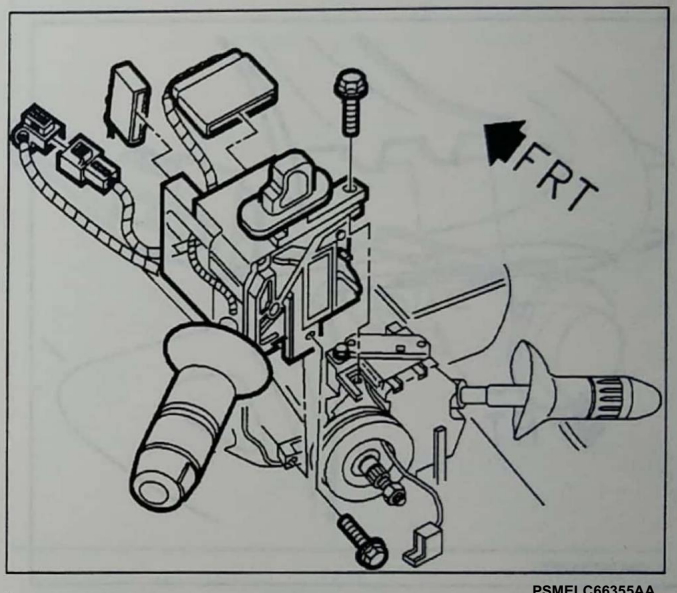
25. Disconnect horn switch connector.
26. Remove nut from steering column that retains steering wheel.
27. Install steering wheel puller SA9218NE and remove steering wheel.



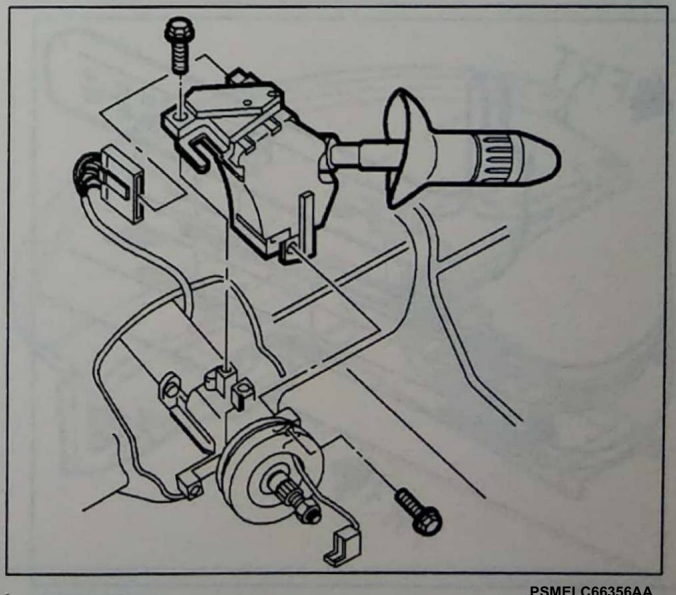
PSMVIS65862AA

28. Remove screws from turn signal, headlamp and cruise switch.
29. Remove switch and disconnect switch connectors.



PSMELC66355AA

30. Remove screws from windshield washer switch.
31. Disconnect connector and remove switch.



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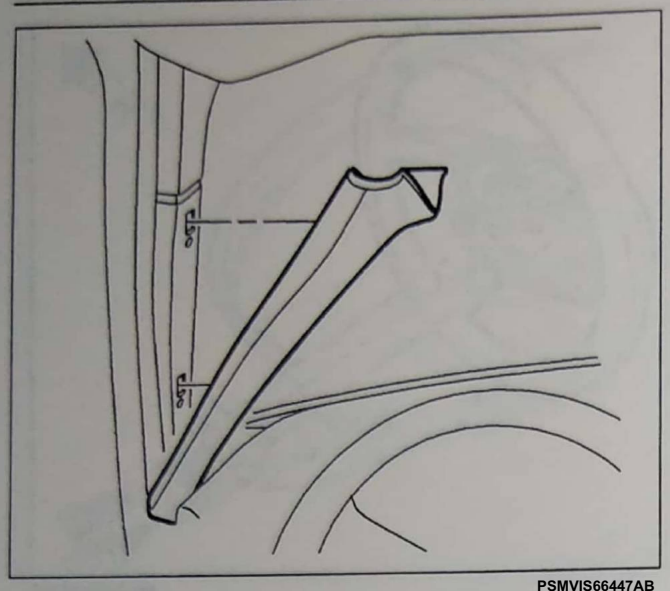
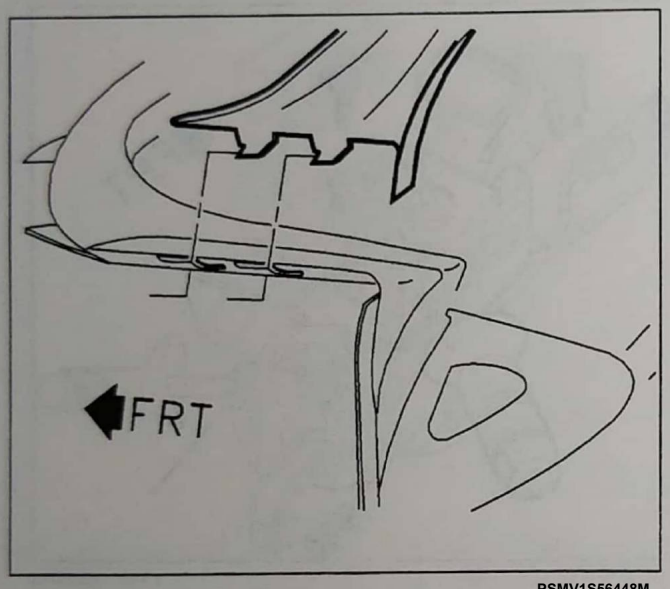


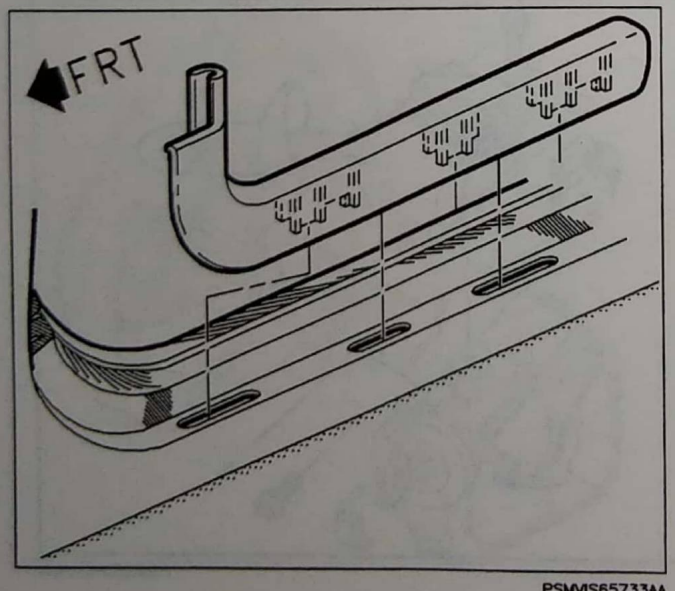
PSMVIS66447AB

32 Starting at top of garnish molding, pull firmly at clip ' locations to disengage. Tipping the top molding inward with the bottom engaged to instrument panel.



PSMV1S56448M

33. Disengage tabs on garnish molding from instrument panel by pulling rearward and inboard.



PSMVIS65733AA

34. Starting at rear of carpet retainer, pull firmly on carpet retainer at clip locations to disengage clips.

35. Remove front side door opening floor carpet retainer.

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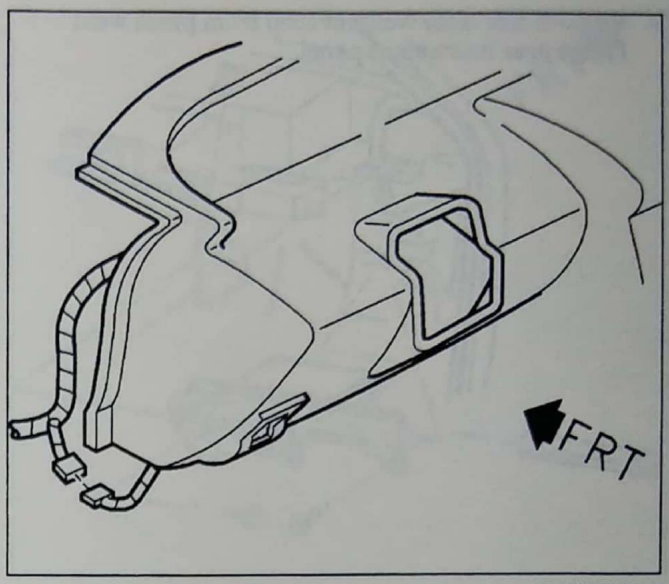
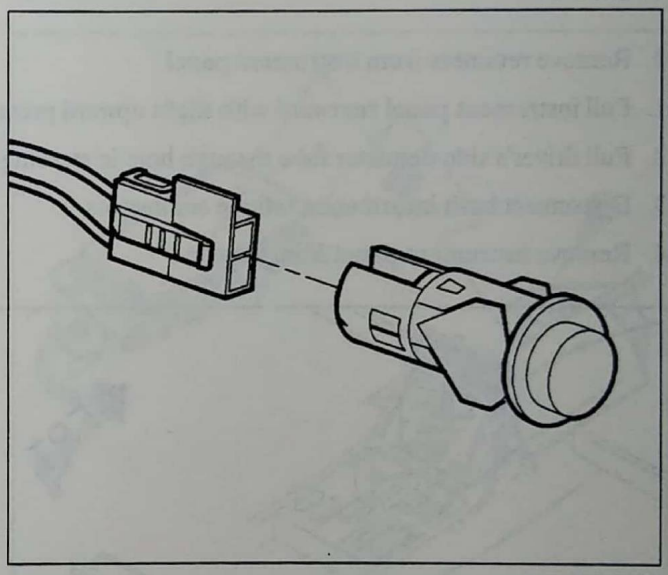
36. Disconnect parking brake switch connector.



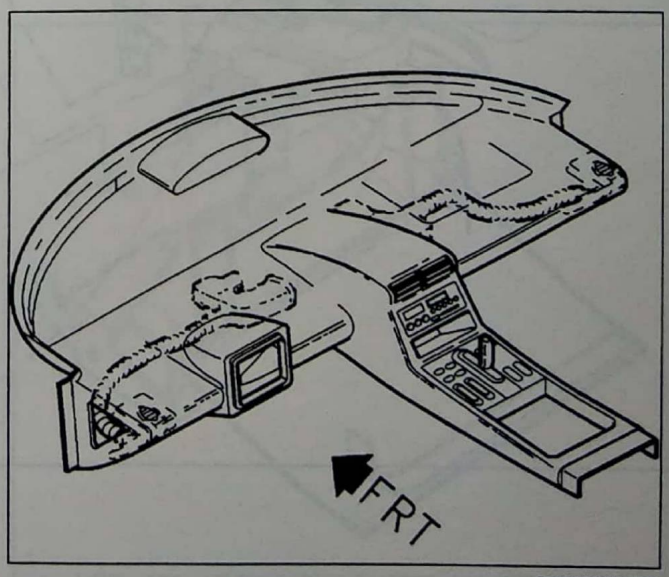
PSMV1S65865M

37. Disconnect auxiliary battery recovery switch connector.



PSMV1S66348AA

38. Disconnect side window demistor tubes from floor outlets.



PSMV1S66047AA

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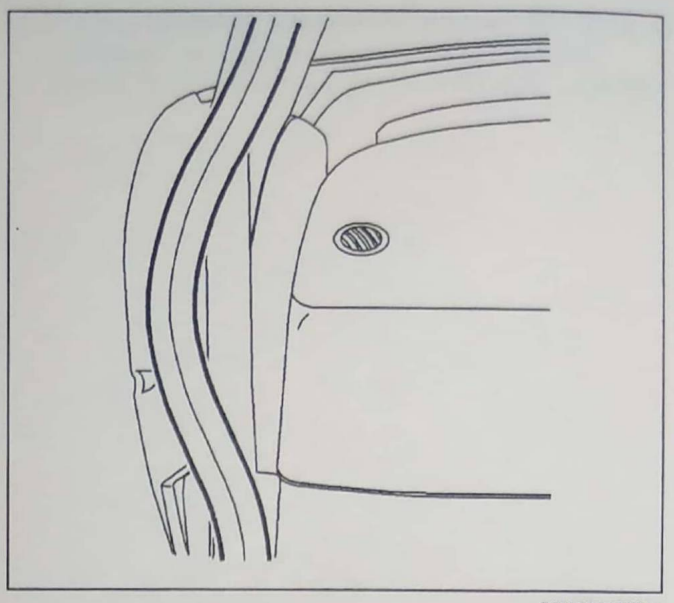
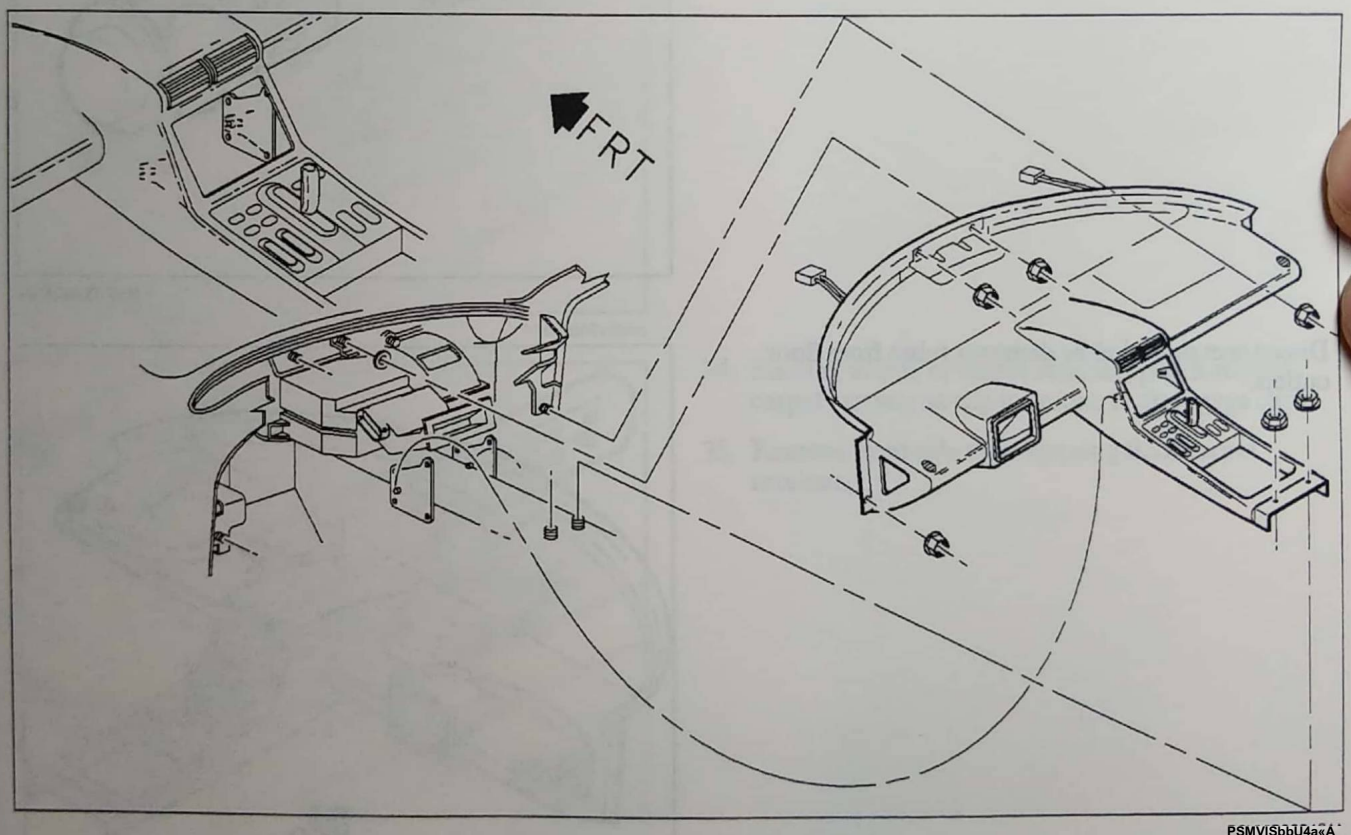
39. Remove side door weather strip from pinch weld flange near instrument panel.



PSMVIS66337AA

40. Remove retainers from instrument panel.
41. Pull instrument panel rearward with slight upward pressure.
42. Pull driver's side demister tube through hole in steering column support.
43. Disconnect both information telltale connectors.
44. Remove instrument panel from vehicle.



PSMVISbbU4a«Â

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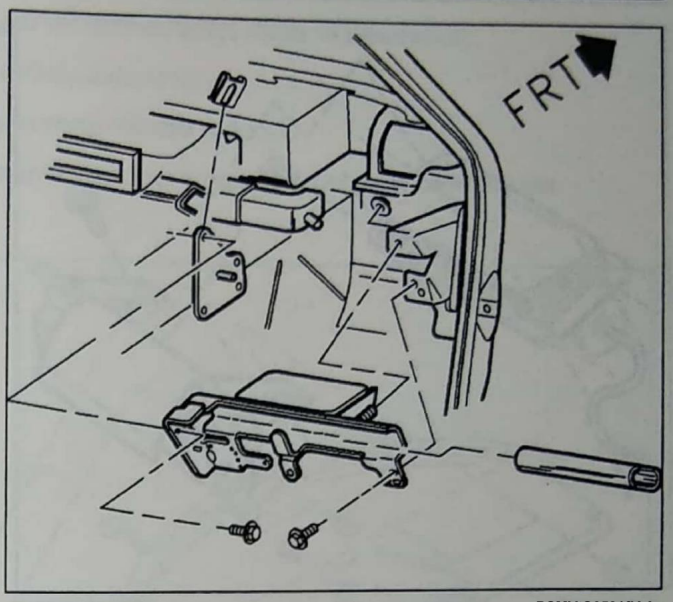
45 Remove passenger side HVAC outer air duct.

46 Disconnect cross car wiring harness rose buds from instrument panel knee bolster reinforcement.

47. Remove bolts and nuts from instrument panel knee bolster reinforcement.

4$ Remove instrument panel knee bolster reinforcement.

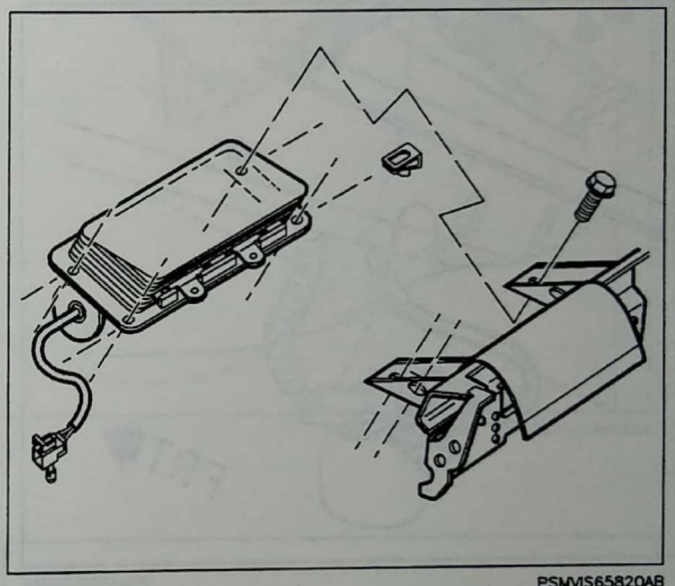


PSMVtS6581flAA

49. Disconnect SIR inflator module wire harness retainer from knee bolster reinforcement.

50. Remove SIR inflator module guidance shute from inflator module.

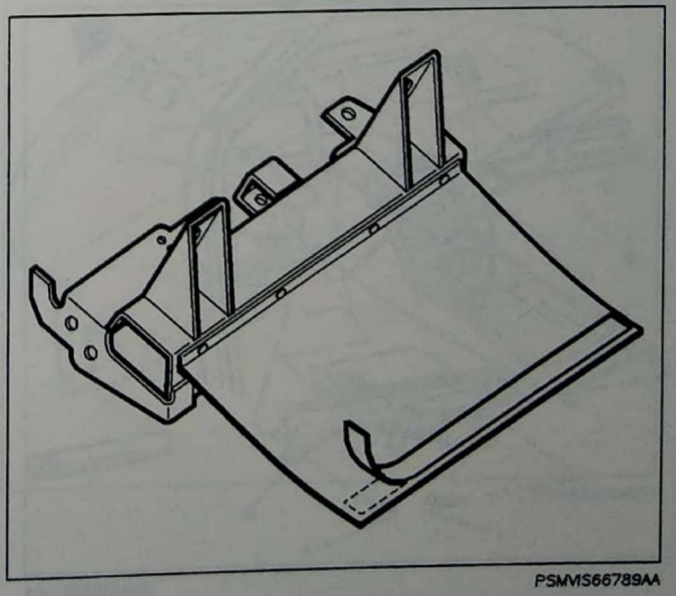
51. Remove bolts from passenger side inflator module to knee bolster reinforcement.



PSMVIS65820AB

INSTALLATION

1- Clean double side tape off of guidance shute and SIR inflator module if reused. Install new tape on guidance shute.



PSMVIS66789AA

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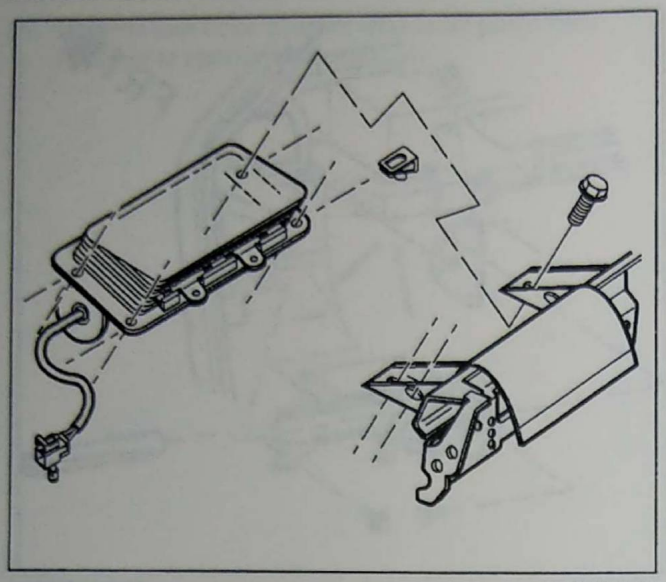
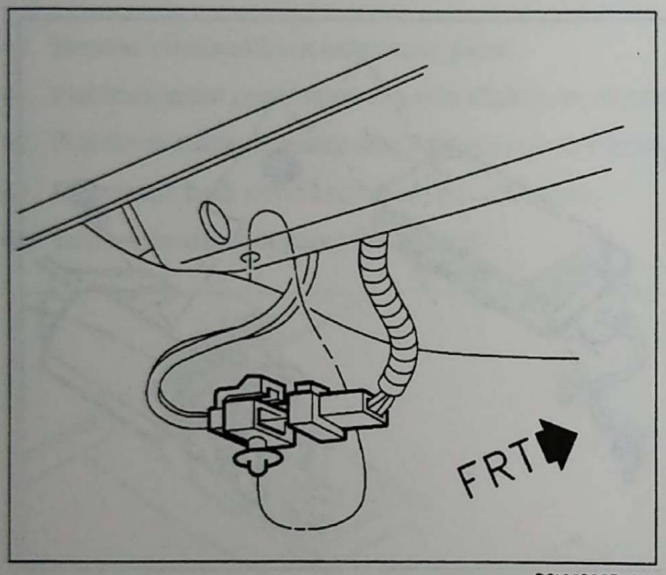


PSMV1S65820AB

2. Install nuts onto SIR inflator module. Install SIR inflator module to knee bolster reinforcement with bolts.

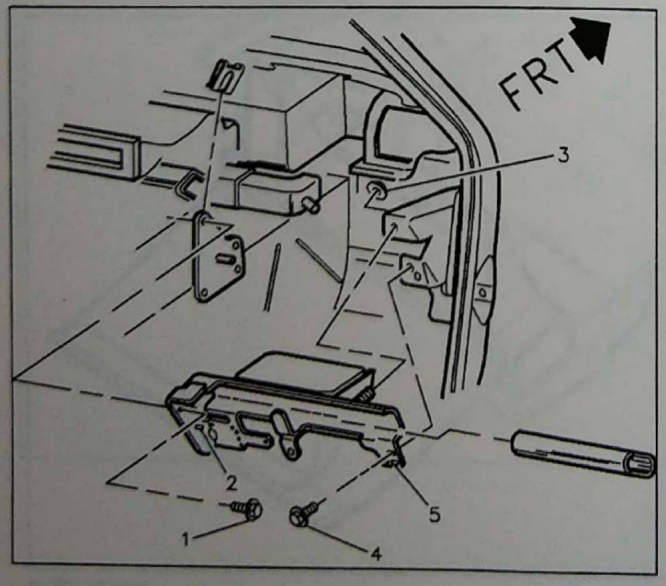
Torque: 10 N*m (7 ft—lbs)

3. Peel backing off of double sided tape and stick to leading edge of SIR inflator module.



PSMV1S66346AA

4. Install SIR inflator module wire harness retainer to knee bolster reinforcement.



PSMV1S65819M

5. Install instrument panel knee bolster reinforcement to space frame. Install bolts and nut. Torque in sequence as shown.

Torque: 33 N*m (24 ft-lbs)

6. Install passenger side HVAC outer air duct into knee bolster reinforcement and seat into heat pump ventilation module. Insert cross car wire harness rose buds into instrument panel knee bolster reinforcement.

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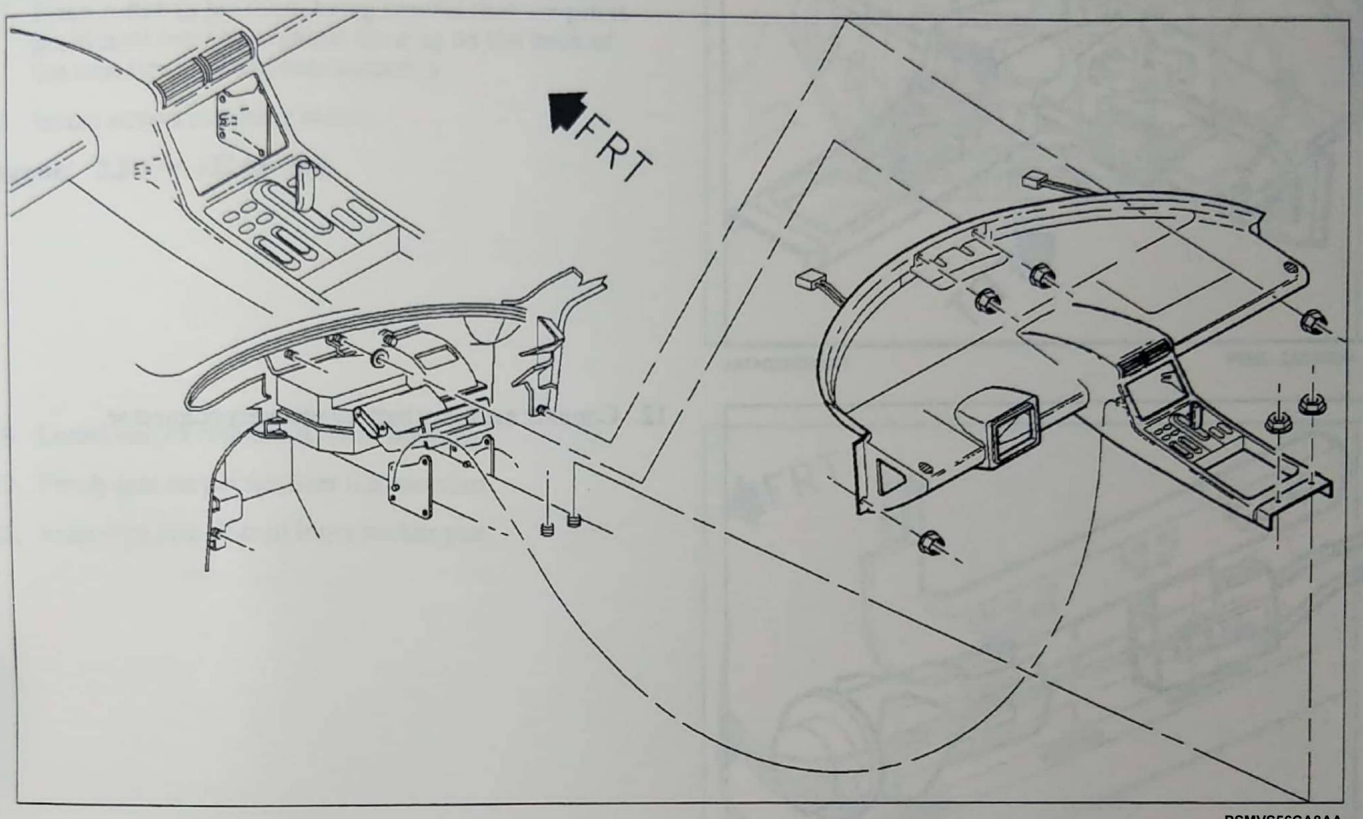
IMPORTANT: Before assembling make sure spacer is in proper location to body. Refer to illustration.

7. Set instrument panel in location and connect information telltale connectors.

S. Guide driver s side demister tube into and through hole in steering column support.

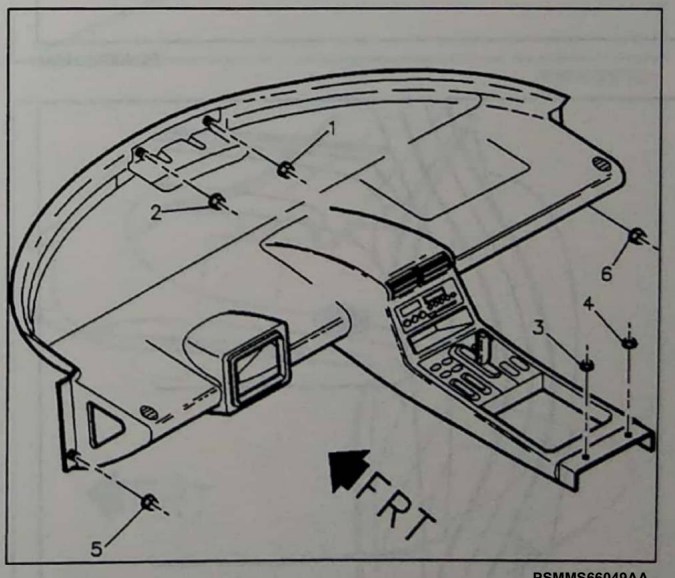
9. Install instrument panel over studs on front of dash. The tunnel has locator pins on either side of which the instrument panel has to be located on when installing.



PSMVS56CA8AA

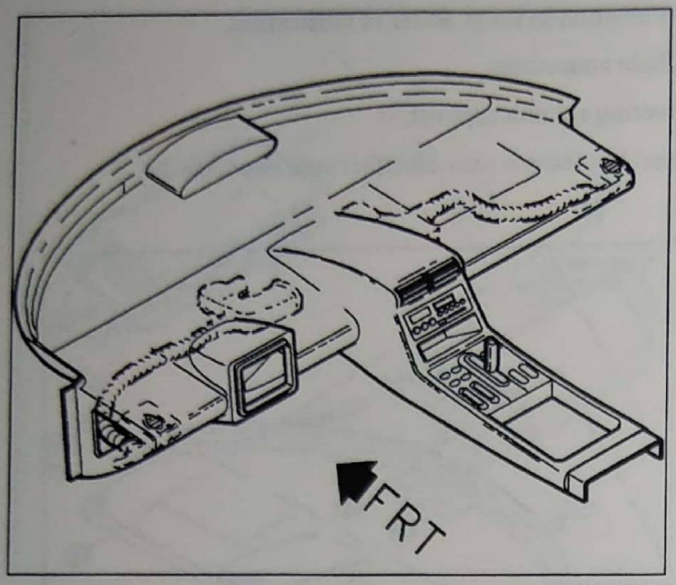
10. Secure instrument panel fasteners.
Torque in sequence shown.

Torque: 5 N*m (44 in—lbs)



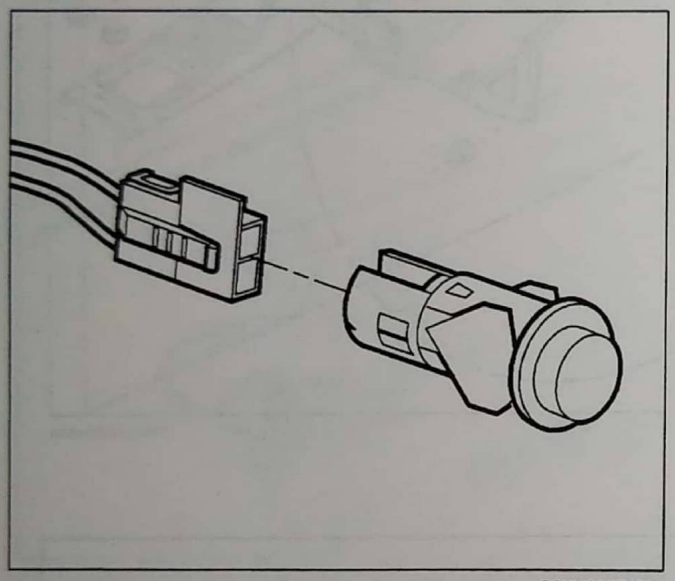
PSMMS66049AA

CamScanner



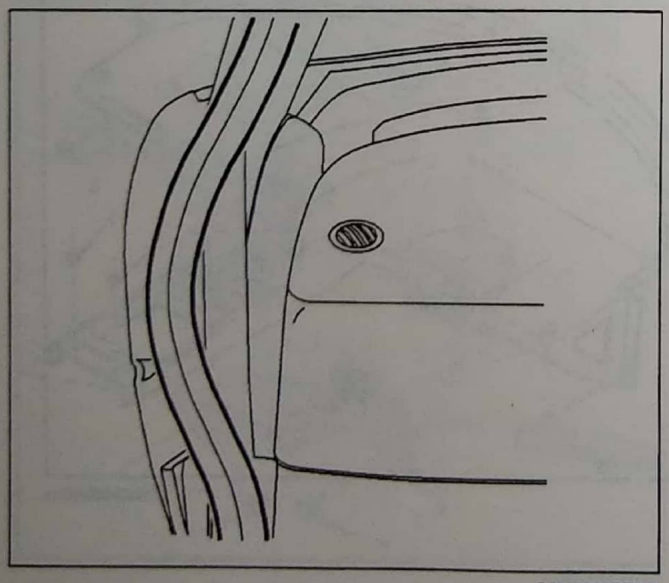
PSMVIS66047AA

11. Connect side window demister tubes to floor outlets.



PSMVIS66348AA

12. Connect auxiliary battery recovery connector.



PSMVIS66337AA

13. Install side door weatherstrip onto pinch weld flange near instrument panel.

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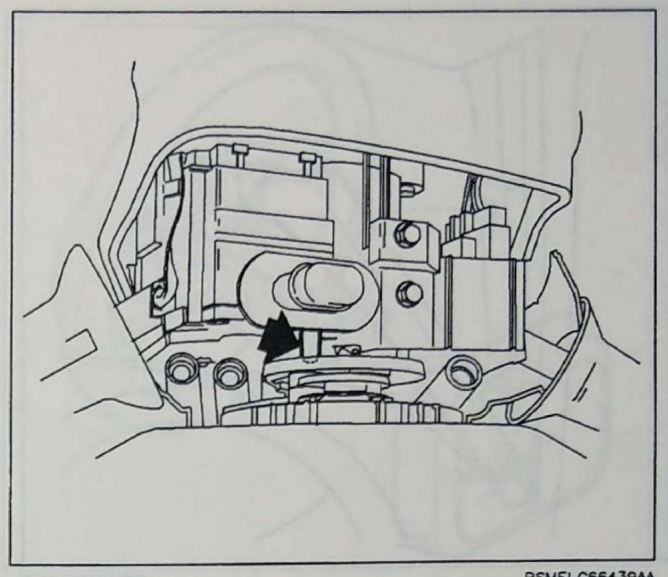
14. Connect connector to windshield washer switch.
15. Install screws retaining switch.

Torque: 2.5 N*m (22 in —lbs)

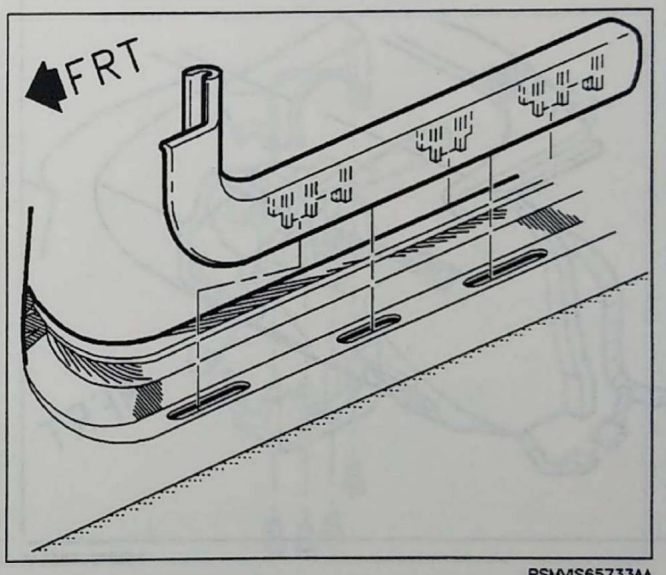
16. Connect connectors to turn signal, headlamp, and cruise switch.
17. Place switch in position, being careful that the pin is positioned correctly against the ring on the back of the turn signal cancel cam assembly.
18. Install screws retaining switch.

Torque: 2.5 N*m (22 in-lbs)



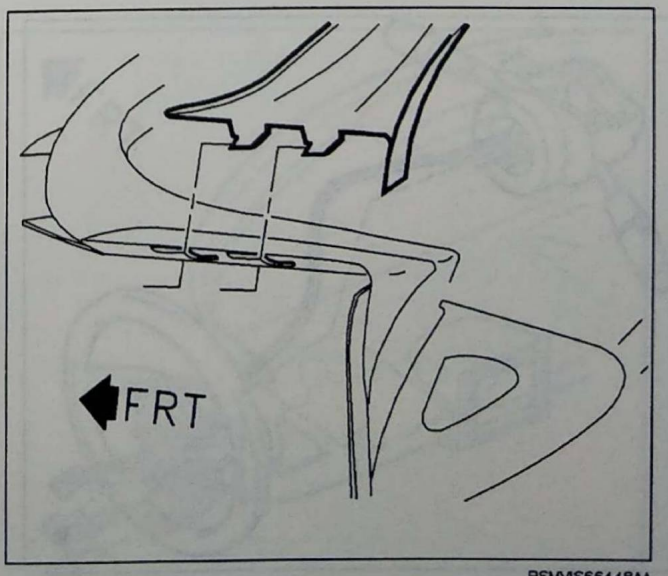
PSMELC66439AA

19. Locate carpet retainer to door opening.
20. Firmly seat carpet retainer into weather.
21. Snap clips into slots in inner rocker pan.



PSMVIS65733AA

22. Insert tabs on bottom of garnish molding into instrument panel.
23. Push molding downward and forward past A-pillar structure.



PSMVIS66448AA

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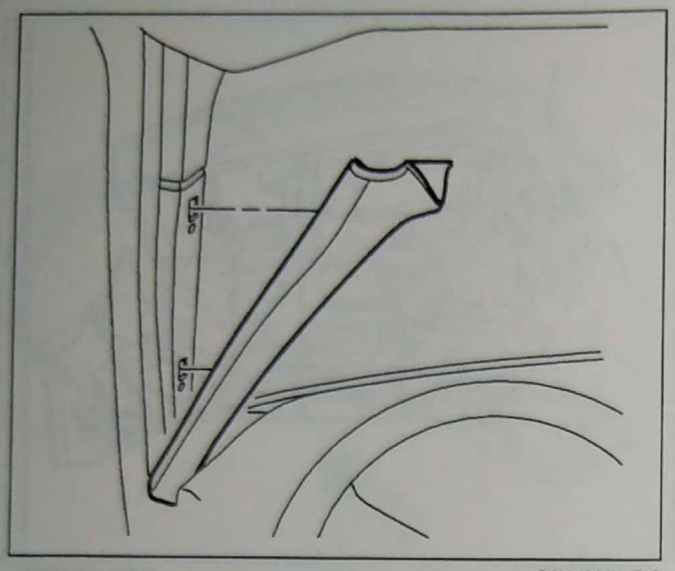
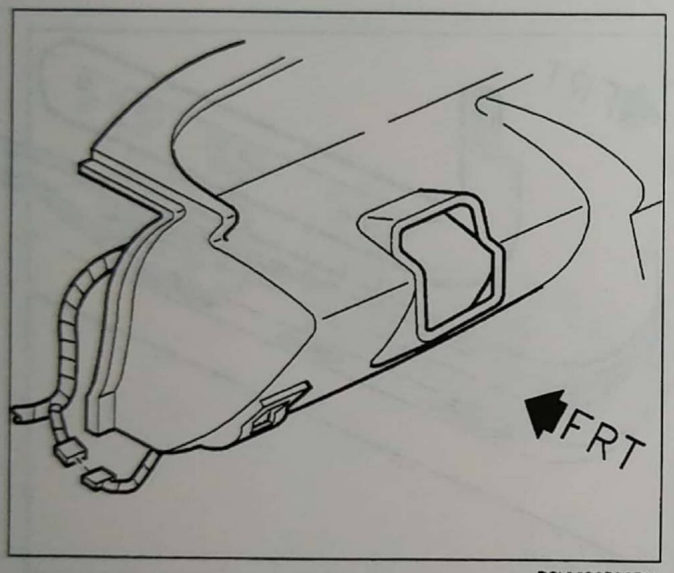


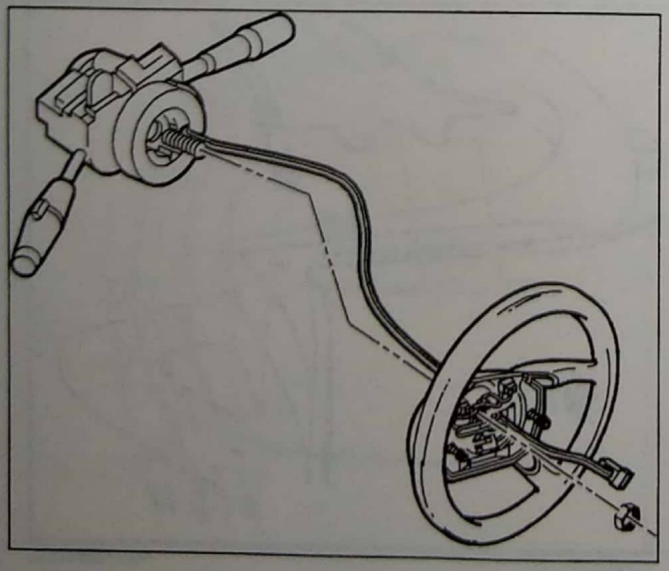
PSMVIS66447AB

24. Push molding to structure pressing forward and outward to insure proper fit to instrument panel, headlining and door seal.
25. Align clips on garnish molding to slots in A-pillar and press firmly at clip locations.
26. Position flap on door weatherstrip over windshield garnish molding.



PSMVIS65865AA

27. Connect park brake switch connector.



PSMV1S65864AA

28. Route SIR cable through steering wheel. Install steering wheel to column.
29. Connect horn wire connector.
30. Install steering wheel nut.

Torque: 42 N-m (31 ft-lbs)

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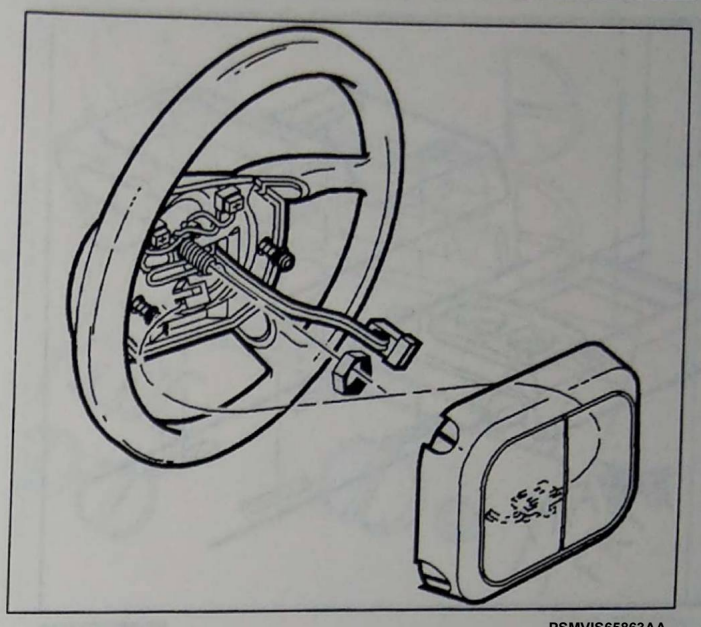
31. Route yellow SIR inflator module wire harness within the steering wheel hub forming an "S" shape with wire and connect SIR inflator module connector.

32. Install CPA, to connector.

33. Install inflator module to steering wheel.

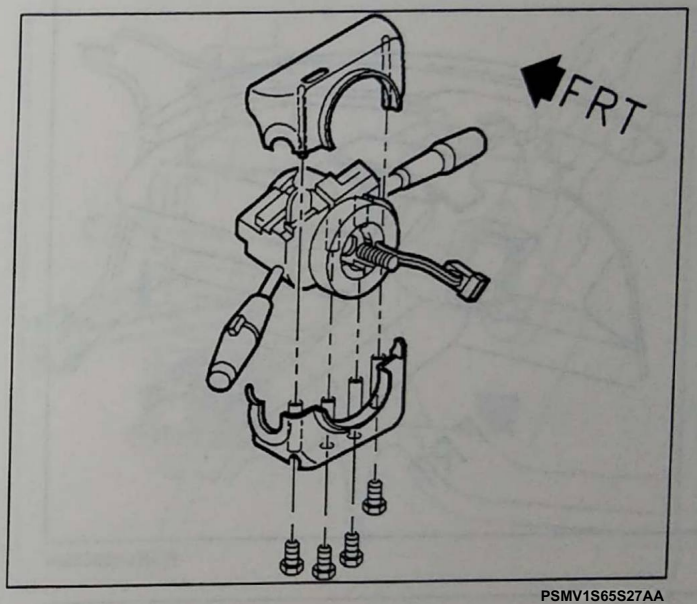
Torque: 10 N*m (89 in-lbs)



PSMVIS65863AA

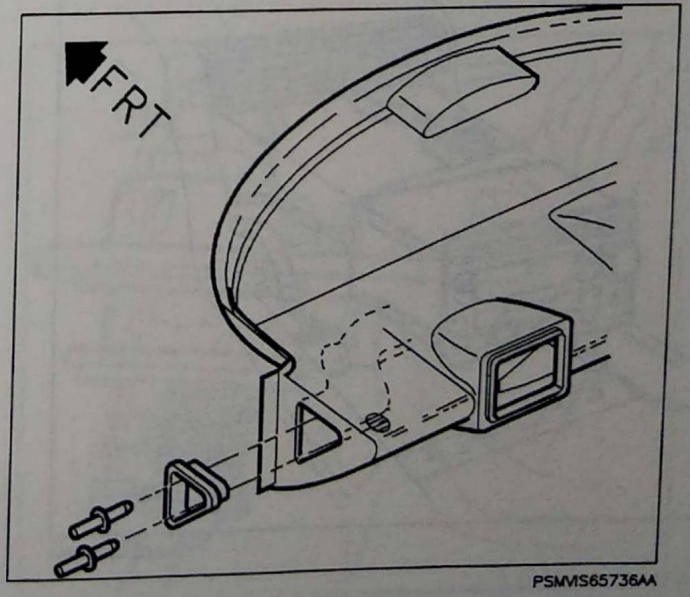
34. Align lower steering column trim cover to steering column. Install and tighten inner screws.

35. Align upper steering column trim panel to steering column and install outer screws in lower steering column trim panel. Tighten outer screws.



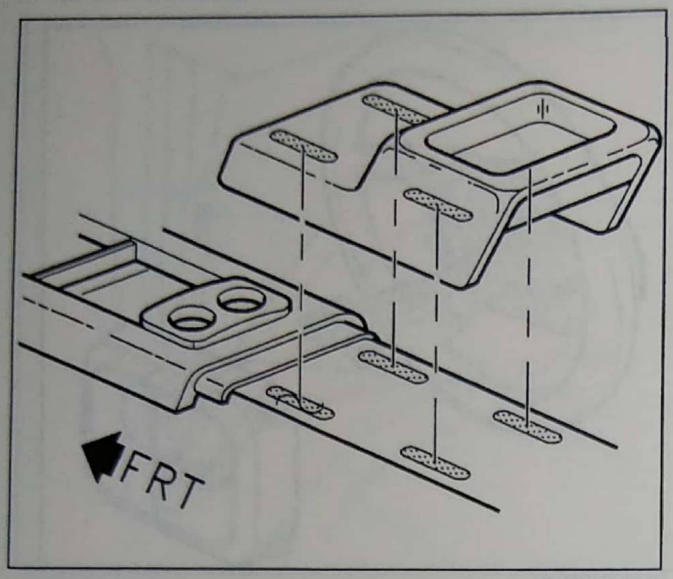
PSMV1S65S27AA

36. Install left and right front side door air outlets on side of the instrument panel using new fasteners.



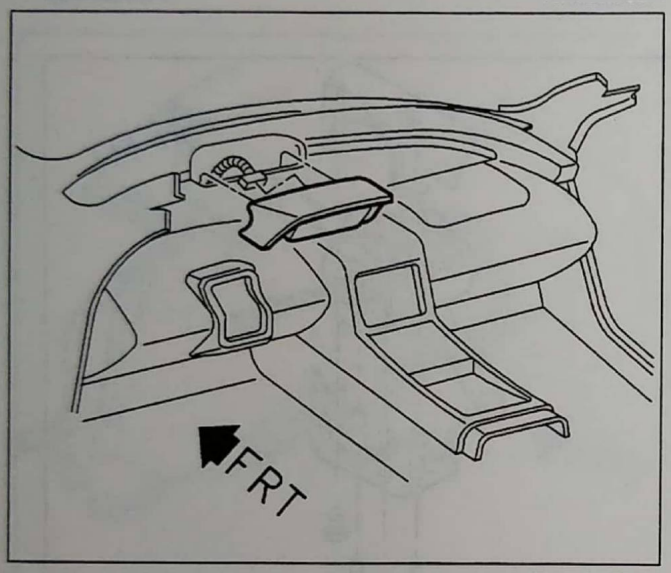
PSMVIS65736AA

CamScanner



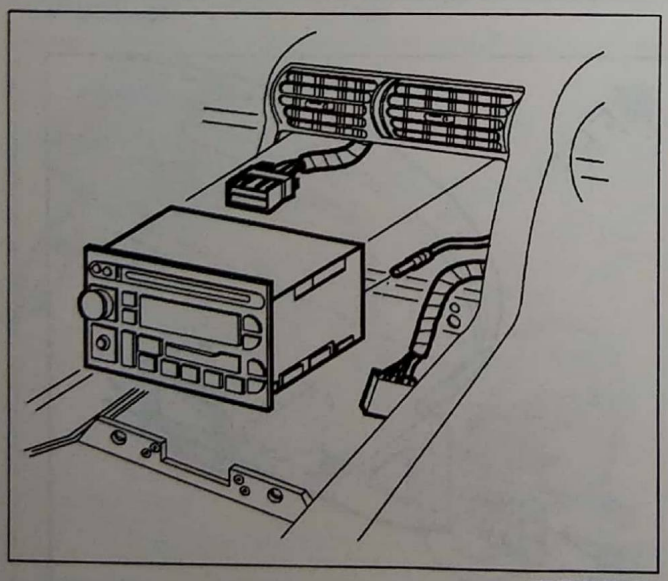
PSMVIS65735AA

37. Install arm rest



PSMELC66359M

38. Push harness connector into socket on instrument panel cluster. Verify connection is made, seated and locked.
39. Install instrument panel cluster into instrument panel by pushing forward and downward.



PSMELC65847AA

40. Connect radio harness to radio, then antenna lead to radio. Verify both connections are seated properly.
41. Make sure antenna and harness are up and out of the way of the radio bracket. Slide radio into opening until the radio is seated and the radio fits tightly to the console. You may hear a click as the radio tab locks into the bracket.

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42. Cover the radio face with a rag for protection during RSA installation. Install shift cable housing into shift bracket and connect and secure shift cable to shifter. Be sure clip lock tab is in place.

43. Connect wire harness connector to RSA.

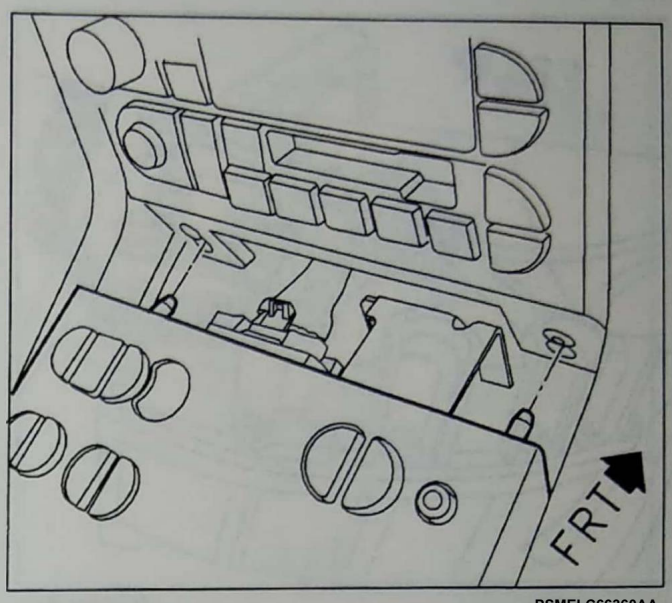
44. Align RSA locator tabs to front of instrument panel and push down on the rear of the RSA.

45. Install torx fasteners.

Torque: 6 N*m (53 in-lbs)

IMPORTANT: You must adjust shift cable at final drive unit.

46. Adjust shift cable:

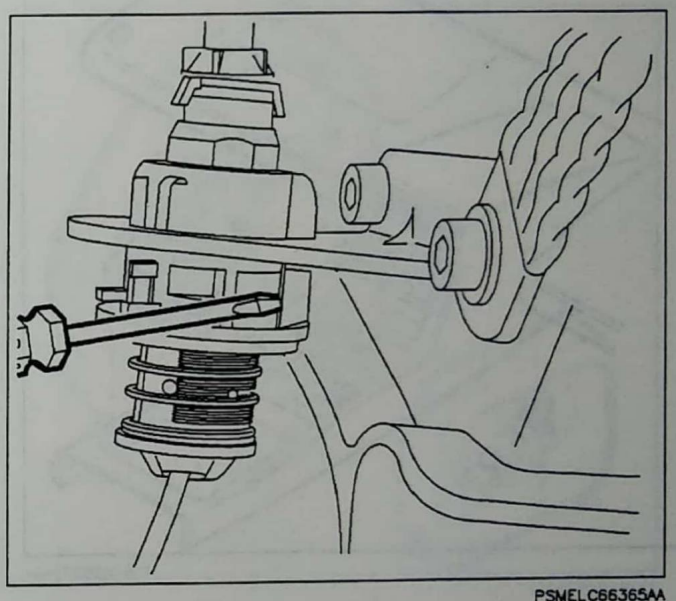


PSMELC66360AA

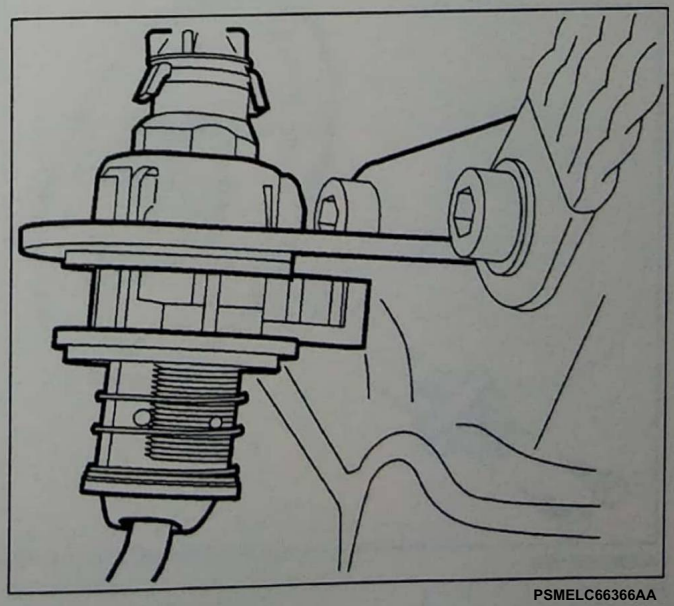
IMPORTANT: The shift cable must be attached to the RSA with the RSA secured in position. Shift handle must be placed in neutral before cable adjustment is performed.

a. Remove underbody front air deflector assembly. (Refer to "Underbody Front Air Deflector Assembly" in the "Body/Repair Service Manual.")

b. Unlock U-shaped adjustment collar. Collar is located aft of drive unit bracket, and will unlock by inserting a pocket screwdriver into gap and prying towards drive unit.


PSMELC66365AA

IMPORTANT: About 13 mm (1/2 in.) movement necessary to insure unlock position.


PSMELC66366AA

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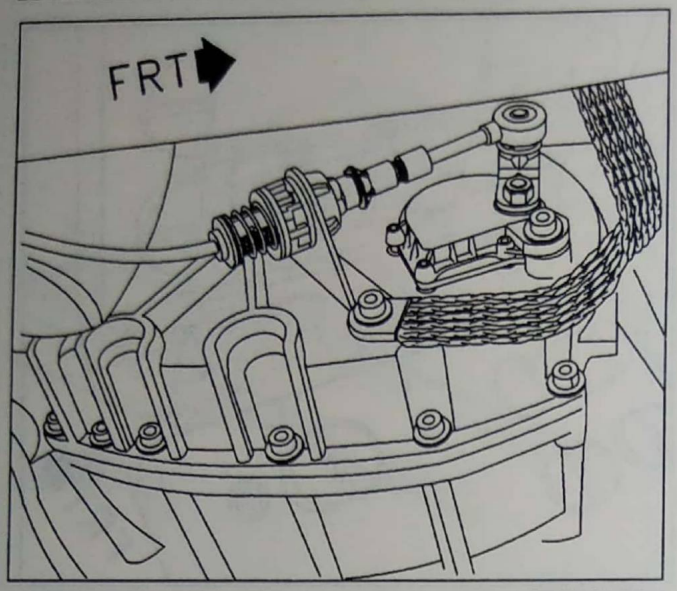
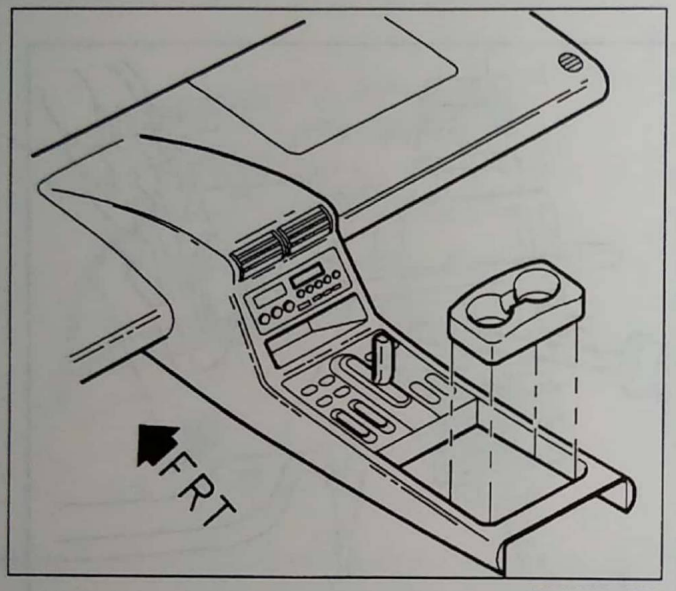


PSMELC66364AA

47. Verify shift lever is in neutral. Push U-shaped collar into lock position. Collar will move to right side of vehicle.
48. By hand shift park/lock lever to the full counterclockwise position (DRIVE) then move one detent in the clockwise direction (NEUTRAL).
49. Install underbody front air deflector assembly. (Refer to "Underbody Front Air Deflector Assembly" in the "Body/Repair Service Manual.")

NOTICE: If shift cable has been removed more than six times at either end, for any reason, the cable must be replaced.



PSMVIS55734AA

50. Install cup holder to center console.
51. Enable the SIR system. (Refer to "Enabling the SIR System" in this service manual.)

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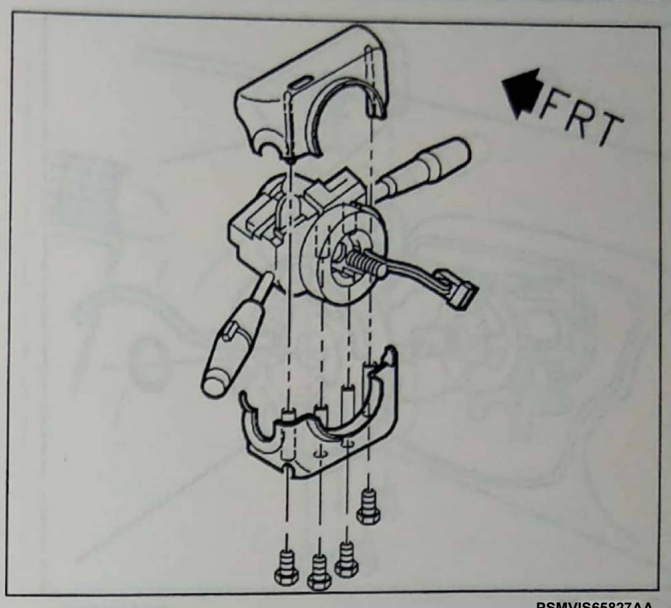
SIR ROLL COIL REMOVAL

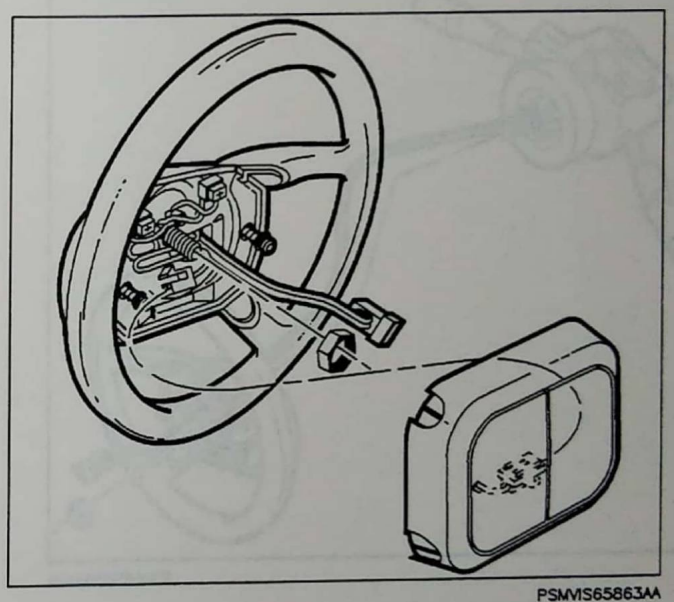
REMOVAL

1. Disable the SIR system. (Refer to "Disabling the SIR System" in this service manual).
2. Remove outer screws from lower steering column trim cover and lift upper trim panel off.
3. Remove inner screws from lower steering column trim cover to remove lower trim cover.



PSMVIS65827AA

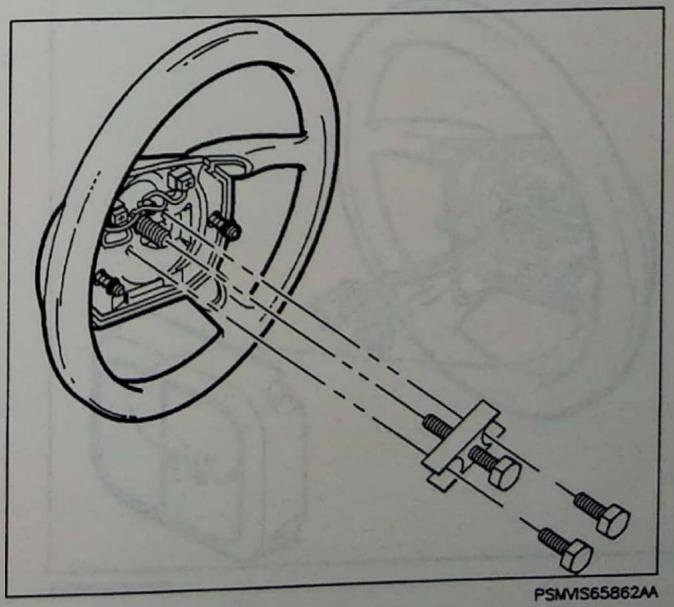
4. Remove screws from back of steering wheel that retains SIR inflator module. Remove connector position assurance (CPA) from SIR inflator module connector and disconnect the connector. Remove SIR inflator module.



PSMVIS65863AA

5. Disconnect horn switch connector.
6. Remove nut from steering column which retains the steering wheel.
7. Install steering wheel puller SA9218NE and remove steering wheel.

CAUTION: ALWAYS ALIGN THE FRONT WHEELS TO THE STRAIGHT AHEAD POSITION WHEN INSTALLING OR REMOVING AN SIR COIL ASSEMBLY, IF AN SIR COIL ASSEMBLY IS REMOVED WITHOUT THE WHEELS IN THE STRAIGHT AHEAD POSITION AND THE STEERING WHEEL HAS NOT BEEN MOVED, THE SAME SIR COIL ASSEMBLY COIL CAN BE REINSTALLED IF THE COIL HUB HAS NOT BEEN ROTATED.



PSMVIS65862AA

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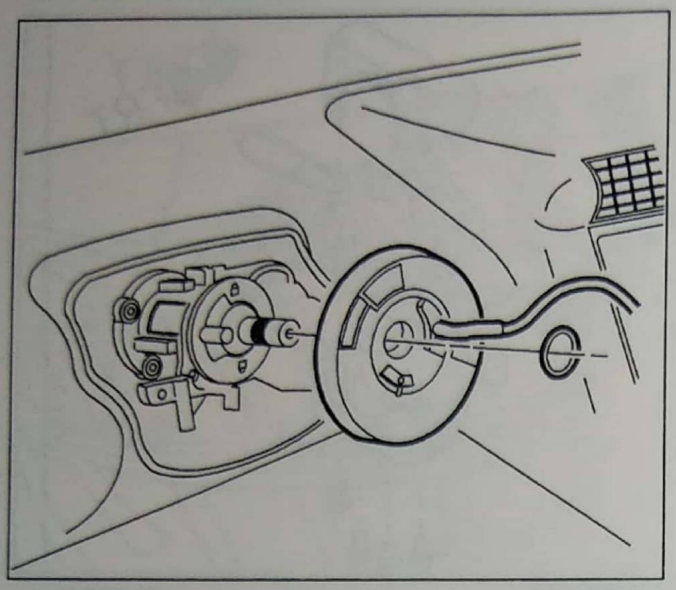


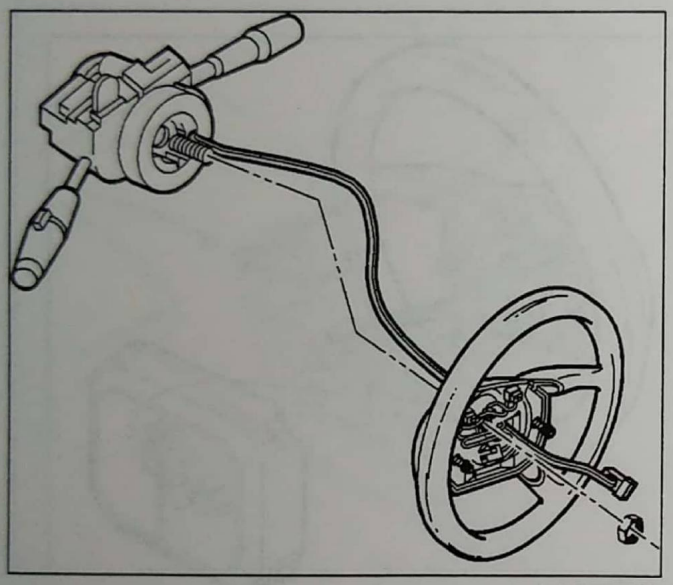
PSMV1S66345M

8. Remove snap ring from steering column shaft and disconnect SIR roll coil at base of column.
9. Slide SIR cable tie wrap down steering column shaft from underneath the instrument panel.
10. Cut tie wrap and remove SIR roll coil with wire.

INSTALLATION

IMPORTANT: A new SIR coil assembly is equipped with a orange tab that is removed after the steering wheel is installed. This tab passes through the steering wheel at the pass through hole.

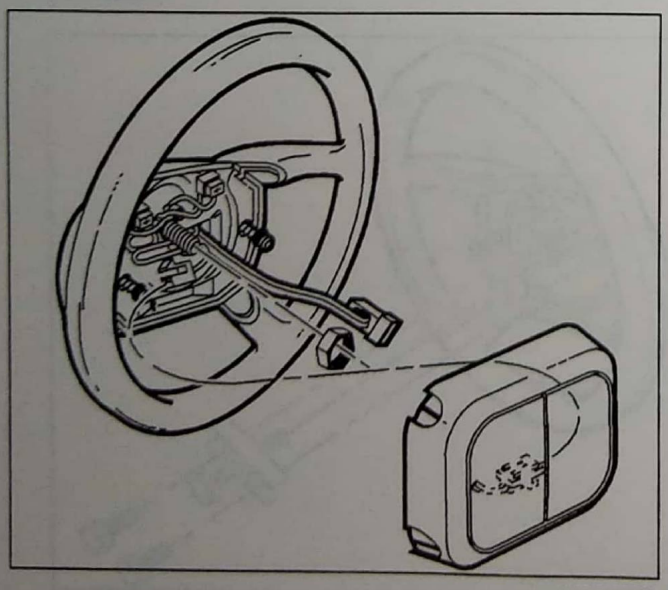
1. Route SIR coil harness down steering column.
2. Install SIR roll coil to steering column and install snap ring. Verify snap ring is seated on steering column.



PSMVIS65864AA

3. Route SIR wire through steering wheel. Install steering wheel to column. Connect horn wire connector.
4. Install steering wheel nut.

Torque: 42 N*m (31 ft-lbs)



PSMVIS65863M

5. Route yellow inflator module wire harness within the steering wheel hub forming an “S” shape with wire.
6. Connect inflator module connector and install CPA.
7. Install inflator module to steering wheel.

Torque: 10 N*m (89 in-lbs)

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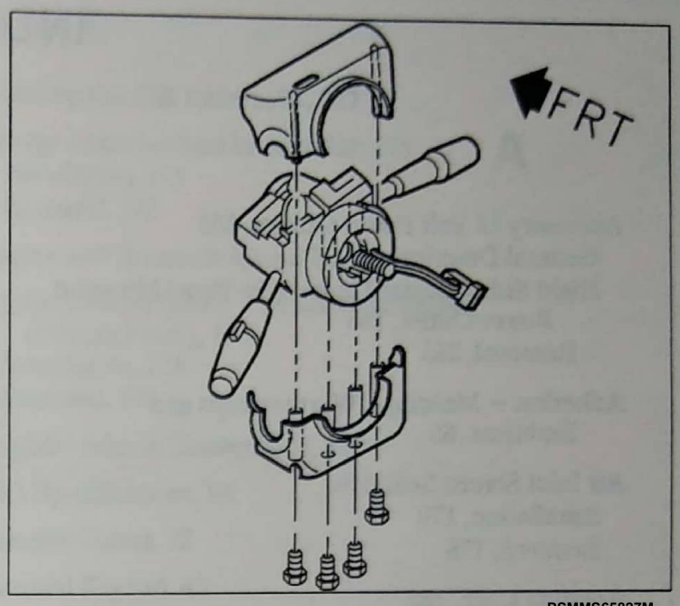
S Align lower steering column trim cover to steering column and install inner screws.

q Align upper steering column trim panel to steering column and install outer screws in lower steering column trim panel.



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Service Manual Contents:

- Body General Information
- Stationary Glass
- Front Wiper System
- Collision Repair Information
- Body Dimensions
- Corrosion Repairs
- Body Paint
- Body Repair
- Front End Body Components
- Door Components
- Rocker Panels, Appliques and Related Components
- Rear End Components

NOTE: Refer to the Index in the back of this manual or the Table of Contents in the front of this manual for location of specific content.

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